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Gathering flowers on a school excursion of the elementary school of the University of Chicago

TEACHING ELEMENTARY SCHOOL SUBJECTS

EDITED BY

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ILLUSTRATED

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NEW YORK CHICAGO BOSTON

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Teaching

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PREFACE

THE art of teaching is based upon a knowledge of children, of society, and of how one is to be adjusted to the other. For a knowledge of children we have the sciences of educational psychology and educational hygiene. For a knowledge of society we have sociology, or the social sciences in general, and educational sociology in particular. Direct experience with children and in society and first-hand study of and participation in life are indispensable to those who would guide life effectively as teachers. For helping the immature adjust themselves happily to our complex social life, we use among other instruments the subjects of study. We call the methods of teaching each of the various subjects of the school *special methods* as distinguished from the general methods of teaching all subjects.

When this book was planned and put into its first form it was expected to cover the field of general methods very briefly and the field of special methods in detail. Chapters on "The Educative Process," "The Learning Process," and "The Teaching Process" were prepared by the editor as an introduction to the chapters on special methods. It was later decided to change this plan, and the second two chapters were removed and printed in *American Education* (Albany, N. Y., Feb. to June, 1917).* The volume on "How to Teach," by Strayer and Norsworthy (Macmillan), and other texts treat of general methods in elementary schools and may well be used along with or preceding this volume. The chapter on "The Educative Process" herein will, we hope, adequately introduce the problems of aims of education, minimal essentials of subject-matter, special methods, measuring results,

* Reprinted by the author and to appear in his volume on "The Consolidated Rural School."

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the junior high school, and the correlation of subjects. The chapters on the kindergarten, measuring results, and the final chapter by Professor Dewey giving a theory of elementary education from the standpoint of pragmatism also contribute directly to teaching the elementary-school subjects in a modern way.

Our chapter contributors have been chosen from among the leading specialists in all the "common branches," most of them having written considerably elsewhere on their respective subjects. It has been the aim to give briefly such a statement of minimal essentials of matter and method as will not only be of assistance to many actual and prospective teachers and to parents in homes who attempt to teach their children, but will lead on to the monographic literature on each subject. With the very rapid changes being made in the elementary-school subjects by the modern scientific methods of educational research and with a teaching population of more than a half million, one-fourth of whom are new to the profession each year and four-fifths of whom have not had normal-school or college training, such a volume, we feel, may be of great service. Professional progress and the wide-spread application of recent scientific discoveries will be facilitated. Teacher-training departments in high schools, normal schools, colleges, summer schools, reading circles, and the teachers in the classroom before their pupils have been in the minds of the contributors while writing.

To help to bring to bear apperceptively the worth while past experience and the best learning attitude of our readers, we have initiated the feature of the "preliminary problems," hoping that previous discussion and meditation will preserve individuality and promote the self-active use of the chapters as instruments and suggestions by which to solve actual classroom problems when they arise. Such problems are a part of good pedagogical methods in the best class instruction. Why should they not find their place in books? No teacher of teachers need use them if he prefers others

or none. They are here for those to whom they may be of service. The projects at the end of each chapter will also prove, we hope, a means to thorough discussion and application of principles advanced. A little theory with much testing and application is far better than its too common opposite. Further, the general division of each chapter is indicated by Roman numerals and subheadings, and the main points are brought together as theses at the end of each chapter. The bibliographies offer a brief but rich list of noteworthy and generally available literature not obtainable by teachers until within the last few years. The many photographs are included at considerable expense because of their distinct additional service as experienced with our recent co-operative volume on "Educational Hygiene."

If the teacher will but take one or two of the best magazines of her profession, such, for a good example, as the *Elementary School Journal*, published by the University of Chicago Press, she will have little difficulty in learning of the latest and best publications for her service as they appear. The recent publication by the National Society for the Study of Education of Yearbooks (14th and 16th) dealing with the minimal essentials of the elementary-school subjects, and the splendid scientific achievements now available in the form of scales for measuring accurately and objectively the progress of pupils in school subjects, cannot be too highly commended for use and have been of much value in preparing this handbook.

To the several contributors for their patient and skilful co-operation, to those who have furnished photographs from all parts of this country and elsewhere, to the publishers for their care suitably to embody and illustrate the volume, and to Frances Chandler Rapeer, my helpmate, the editor here publicly expresses his deep appreciation.

L. W. R.

State College, Pa., June 1, 1917.

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TEACHING ELEMENTARY SCHOOL SUBJECTS

CHAPTER I

THE EDUCATIVE PROCESS

PRELIMINARY PROBLEMS FOR INDEPENDENT STUDY[1]

1. What do people usually mean by being educated or "getting an education"?
2. Can a person become fairly well educated without attending school?
3. What man and woman in your community are most like your ideals of what boys and girls should become in adult life?
4. What educative forces in school and out tended to make them admirable?
5. What admirable qualities and abilities do they possess?
6. How can we judge whether a person is educated or not?
7. What phases of education, if any, cannot be carried on by the school?
8. How can we determine what subjects or phases of subjects are of most value to elementary school pupils?
9. What is the average length of preparation and of service of elementary school teachers in this country, and what effect has this on the development of a science of education similar to the science of medicine?
10. What do you consider the chief points of difference between a trade and a profession?[2]

[1] We have tried to preserve the individuality and to stimulate the self-activity of our readers by providing preliminary problems for independent study before the respective chapters are read. If these or others are worked out first, the reader will find that he not only understands the chapter better when he reads it, but he can utilize better his own experiences in thinking out the solutions to his own problems. The chapters are to be read for the suggestions and data they contribute to the individual solution of practical school difficulties.

[2] See Professor Palmer's little book on "Trades and Professions" [21].

I. The Educational Situation

How to teach successfully in the elementary schools of our country is an annual and persistent problem to about a half million teachers. Of these approximately one-fourth are new to the profession each year, taking the places of those who have "kept school" for a shorter period on the average than it takes to learn to do well this delicate and important work. The situation is in marked contrast with the practice in certain foreign countries, such as France and Germany, where teaching is entered only after keen competitive preparation lasting a number of years, and the average term of service is near that of physicians, lawyers, bankers, and others—a life-work [29].[1] Lack of preliminary professional preparation and of teaching experience, for a large percentage of our teachers, combined with rising standards of preparation, daily efficiency, and "keeping up" with rapid changes and developments in social conditions and in the science and practice of their profession, tend to make this problem of teachers more general and acute. Adding to their difficulties we find also (1) frequent lack of opportunity before they enter the profession to study under permanent and highly-skilled teachers who may serve as examples, and (2) a wide-spread lack of skilled supervision and instruction after they enter, especially in rural and village schools. Many teach poorly because they have never seen good teaching done, nor learned before or during service the principles and skill necessary to effective teaching.

Recent investigations by the United States Bureau of Education and other agencies show that on the whole the average professional efficiency of the entire group of persons who teach school each year is far below what it must be, and probably very much lower than that of some of the other professions in which long technical preparation, lasting one

[1] Bibliography at end of chapter.

to four years beyond a college course of four years, a life spent in the work frequently in one community, higher annual salaries, and more stimulating working conditions are the rule [17]. We as teachers may well consider, for example, the skill, the knowledge, the methods of preparation, the cumulative and recorded experience, the standards of self-sacrificing devotion to community welfare, the constant study and "keeping up to date" necessary, and the general ethics of the medical profession. The professional standards which we find being attained among the best physicians here and abroad, and the high standard now reached by the teaching profession in France and Germany are goals toward which teachers in America are slowly approaching. Certainly the standards which now prevail will soon be rendered obsolete in the inevitable advance toward the higher-efficiency demands of both the public and the profession. It is for that large proportion of prospective and actual elementary school teachers who are attempting to live up to high professional ideals as public, official teachers in America's democratic schools that this volume has been prepared by specialists in the methods of teaching the various elementary school subjects.

The free, public, elementary schools, compulsory for all children from five to seven up to twelve to sixteen years of age, have been slowly and resolutely established at considerable sacrifice by the American people. "The little red schoolhouse" now dots the land from sea to sea, and, until quite recently, the confidence of the great majority of our people in its far-reaching value and influence has been almost unlimited. However, the recent and increasing number of local and state-wide surveys and investigations of school systems are both symptoms and causes of a desirably more critical and helpful attitude on the part of the public. The vigorous and scientific reorganization now going on in both rural and city elementary schools, and a greater tendency to make educational experiments, such as the Gary system,

the six-six (or six-five) plan of reorganization, rural school consolidation, elimination of useless subject-matter, measurement of results, and so on, bid fair to give in the next decade or two many decided improvements in methods of teaching, administration, courses of study, qualifications and requirements for teachers with accompanying financial and social recognition, and in generally improved social service to the supporting communities [16]. All teachers should be abreast of and participate in these movements. Many of them will be leaders.

Methods of teaching school are determined by the nature and needs of society on the one hand and by the nature and needs of the children on the other. The fact that the human race has a pronounced tendency for its members to live little longer than seven or eight decades as a maximum makes contingent an immature proportion of the population quite large in extent which, in the highest civilizations, has to be raised, by passing on the social heredity, through many higher levels than those which separate the children of primitive peoples from their parents. Analysis of recent national-census statistics shows that approximately the following proportions of the population are of these immature-age groups:

Under 5 years	12	per cent of the total population.			
5 to 9 years, inclusive	11.6	"	"	"	"
10 to 14 "	10.6	"	"	"	"
15 to 19 "	9.9	"	"	"	"
Under 20 years	44.1	"	"	"	"
5 to 14 years	22.2	"	"	"	"
5 to 19 "	32.1	"	"	"	"

This is "the white man's burden," cheerfully carried by a mature group which, after eliminating the superannuated and non-productive members, is of almost the same size as the immature group—an average of about one child or youth to each person of productive maturity [15, Chap. I, and 14].

If people lived to be a thousand years old on the average instead of about forty as at present and the number of births were proportionately decreased, the problem of elementary and secondary education would not be one of such magnitude. As Spencer quotes from an old song, in his "What Knowledge is of Most Worth":

> "Could a man be secure
> That his days would endure
> As of old, for a thousand long years,
> What things might he know!
> What deeds might he do!
> And all without hurry or care."

With all of our increasingly successful efforts to raise the average term of human life, we shall probably not suffer much nationally from injurious and non-productive old-age conservatism and aversion to progress. Almost a fifth to a sixth of the population will continue to be of the present elementary school ages, and society will constantly have the contingent problem of helping at great cost the immature members to become desirable mature members.[1] It is in this sense that teachers are makers of society.

II. The Aims of Education

Education and the Goal of Life.—The most fundamental answer we can give to the problem of the function of education is that it, like all other social processes and institutions, must help people to realize or attain the goal of life. Many answers have been given to the questions, "What is the aim or goal of life?" "What are we to attempt to help children and adults to attain?" and "For what are we living?" The answer has always been difficult to discover and to state in any single term or terms, largely, as Professor Dewey points out, because life itself is the final goal:

[1] If the six-year elementary school becomes the typical one in place of the eight-year course, as seems now probable, the percentages will be, of course, slightly different.

The ultimate end is simply life itself, an increase of its own vitality, and an enriching of its meaning. This is *in*valuable, and so undefined except with respect to the need which shows itself in life at a given time. Discipline becomes a value from the need of methodic power in the guidance of life; knowledge, because of the need of insight and judgment; utility, because of the need of control of the conditions of the environment, and so on. . . . Recognize that the educative process is in the last analysis identical with the process of life, and that life is not life save in growth, and education itself becomes an invaluable or ultimate [14—Values].

Happiness (both individual and social), self-realization, duty, achievement, adjustment, normal functioning, growth, and other single aims have been set up as the goals. "Social efficiency" is a valuable term to use as a goal when it is carefully defined to include all that we have found best for "vitalizing and enriching" life. Christ's statement, "I came that ye might have life and that more abundantly," is of great value as an aim of education when we learn the factors which make for "life and that more abundantly." This answer to the enigma is very close also to that given by Spencer of "living in the widest sense," or "complete living." As a general ethical statement of the goal, "self-realization" comes near to being a satisfactory term—the rational control of life in such a way as to attain not only pleasure and happiness for all but other important and desirable ends held up by reason, as the highest phase of the self to be realized, and which may perchance be in conflict with happiness and pleasure on the more instinctive plane.

The constituents of the aim of education include the lower utilities of mere self-preservation—health, mastery of a vocation, and ability to get on well in society. The standard in reference to each of these varies. The health requirements of one age are not so exacting as they may be in the next, and the same is true of vocational skill or social adaptability. Education is bound to consult the existing standards and to strive to better them where this seems desirable in view of the other aims of life. The aim of the school includes [also] the higher utilities, the ideal values of life, knowledge, beauty, and morality.

These values are, as we have seen, grounded in instinct. Curiosity leads on to the ideal of the intellect; the parental and social instincts lead, when rationalized, toward the ideal of duty, and there are doubtless instinctive preferences of taste which are the foundation of intelligent esthetic appreciation. Since the ideal is in each case the instinct rationalized, we may speak of it as the ideal of the reason [18 : 528].

The constituents of the educational ideal include such fundamental conditions of self-preservation as health, vocational efficiency, and conformity to the social order. These are factors of the simplest phase of utility. The educational aim concerns [also] the service of the ideals of the reason, knowledge, artistic taste, virtue. These are the higher utilities, because in man's scale of valuation they are held as of greater worth. The highest utility is the service of self-realization, and in the control of this the school may be assigned a voice. But everywhere it must keep close to practice, to relative values, to the gospel of achievement. It must be on the alert to the verdict of practice on its work. It must combine a wise conservatism with willingness ruthlessly to cut loose any form of culture, the service of which has fallen below that which its presence excludes from the curriculum. Especially should the school cultivate the spirit of critical valuation or of utilitarianism among its pupils, for only through this can they achieve the highest service both for themselves and for the society in which they live [18 : 533–4].

While self-realization is a valuable philosophical term to hold up as the end or goal of life it has the disadvantage of being misunderstood as emphasizing the selfish, while terms like social efficiency, achievement, social happiness, and social progress are usually more meaningful and exact, and so probably more serviceable. Any term like happiness, duty, culture, growth, or self-realization can be so defined and its elements so selected as to cover the meaning of other similar terms. The teacher should know her social and ethical philosophy well enough to get value from all and to see the underlying unity in them. She will usually find it difficult to state the ultimate goal of life and education by any satisfactory single term, but the proximate factors or goals are more easily named, and these she will find of the greatest value for every-day guidance. Our Declaration of Independence speaks of "life, liberty, and the pursuit of

happiness," the first two contributory to the last, as being the object of our separation from the mother country. In somewhat different words, the utilitarians have used well the same goal of "the greatest good to the greatest number."

In these times of great continental wars we see that national or race perpetuation is no small part of the aim for all peoples and institutions. Its importance is realized when we learn that China has used her school system to promote national peace and perpetuation, and has actually succeeded in self-perpetuation, from the days of early Rome, which has long since gone down in dust, ashes, and disgrace, though at one time a democracy like our own. If a too intense and narrow nationalism has separated nations and destroyed peace to-day, a greater *world* patriotism and citizenship must be cultivated. Aristotle said that in a democracy the schools should be devoted to promoting the principal aims of a democracy in order to insure the success of this type of life; and Lycurgus in practice and Plato in theory established public schooling systems that were dedicated and thoroughly organized to promote the welfare of the nation. In general, the principal aims and problems of a nation or people set the principal problems and aims of its state-supported and state-controlled schools.

Need of Social Insight on Part of Teachers.—These principles which identify the general goal of education with the goal of life and of national and world progress involve the requirement that teachers know excellently well, first of all, our present-day complex (industrial) civilization, and the principal aims and problems which we here in America face. The principal moulders of the life of the nation must be persons with a thorough appreciation of the nature and meaning of our national life. To change the figure, the blind cannot well be leaders of the blind. Social science, beginning with acquaintance with the life of the people of the community, is thus of as much importance to the teacher and educator as a knowledge of child psychology and hygiene, indispensable

as the latter are for skilfully guiding the growth of children toward the best type of social life to-day. Community and general social needs and aims stand first. The hand at the helm must see the guiding star.

The nation as a whole and each community are still carrying on, in an industrial and scientific era, our great experiment in democracy. No one yet foresees the outcome. Partial failure and manifold unsolved problems confront us on every hand. We have yet to live up to the expectations of our nation's founders. Poverty, crime, political injustice, an enormous preventable death-and-illness rate, industrial oppression and lack of vocational preparation, immorality, selfishness, greed, graft, political indifference, lack of citizenship, inability of citizens to co-operate, to take the initiative, or to lead in public causes, insufficient and poorly used leisure, indifference to the higher esthetic and intellectual activities which made Greece the pride of the ages—all these forms of serious maladjustment, which mean wide-spread failure to realize any reasonable goal of life, are still with us, contrary to the sanguine expectations of our forefathers for this glorious new country. It is significant that the United States Bureau of Education is at this late day asking for large appropriations to use in attacking the problem of bare illiteracy, greater here than in many modern foreign countries, and far below the necessary and minimum foundations of education for present-day democracy. These problems are especially the problems of all such government officials as teachers in public schools dedicated to social stability and amelioration [9, 10, 11].

Proximate Ends of Education.—Professor Bagley has ably argued for " social efficiency " as the final goal of education. As he defines it, and since both happiness and self-realization are apt to be misunderstood and misused, thus "leading from the path direct," the term has many practical advantages. Social efficiency, of course, is ultimately a *means* to the vitalization, growth, and enrichment of life; self-realization and rational character are reached thereby; and individual and so-

cial happiness, or enriched and vitalized experience, characterizes such living. The goal of living is superior living [13].

A chart may easily be made showing the factors of the ultimate aim of life and education according to several different educational philosophers. Constructed from several different points of view, they are all helpful. Most persons will, for example, readily agree with the analysis given by Professor Yocum below, especially since his term "vocational efficiency" includes both domestic and economic efficiency. These are easily understood problems of both the community and individual, and ends for the promotion of which, as will appear later, the schools are especially responsible.

A modification of Gidding's list of the aims, or "goods," of life and of education as given in his "Elements of Sociology," and based on the list given by Herbert Spencer, has been used by the writer in another place,[1] namely:

1. *Self-preservation*, including the attainment of such minimum goods essential to happiness or complete living, as health, food, clothing, shelter, and general protection.

2. *Race-preservation*, including all that is necessary to make home life better, the relations of the sexes less a cause of serious maladjustment, and national or racial life more permanent and meaningful.

3. *Association*, including all that makes social organization, social co-operation, and social happiness through group activities advance to a higher plane.

4. *Emancipation from fear*, including all that substitutes science, confidence, and trust for superstition, excessive competition, warfare, and ignorant prejudices and attitudes.

5. *Individual growth and self-realization*, including all that promotes the most complete social development of the individual through rational self-activity, life-education [13].

These factors found by analysis have proved of value in setting up standards for judging the worth of the content of

[1] In *American Education* for June, 1913, article entitled "Educational Sociology." Published at Albany, N. Y.

courses of study, and for holding up guiding points for methods of teaching. Teachers very much need such standards and such an analysis of the problems of life, since one of their great temptations is to teach subject-matter from text-books with too little regard to the relative worth of the matter for achieving any of the goals of education. Superintendents, supervisors, and principals need them, for they have the tendency also to take subject-matter by the "scissors-and-paste" method in making their courses of study, simply copying imitatively what other schools have done instead of discovering, surveying, and facing the problems which individuals, community, and nation have to meet, and then helping them to attack these problems by such subject-matter and activities as will actually and most effectively solve them. An examination of the common and traditional high school curriculum will show that it quite largely omits preparation along many or most of the lines laid down as fundamental minimum essentials above, *e. g.*, health, vocational efficiency, citizenship, avocation, and morality. The elementary school will find also that it has overlooked essentials for non-essentials because of a lack of such guides. Fortunately, in both elementary and secondary education there is to-day a general awakening to a sense of relative values, based on scientific analysis which is to take the place of our former naïve traditional imitation of "sanctified" subject-matter and methods.[1]

Many of the recent educational surveys and other investigations previously mentioned have asked of entire cities and states how well they were contributing to human welfare along one or more of these lines. The city of Minneapolis, Minnesota, for example, recently made a thorough study of the needs of its citizens industrially, and of how well it was

[1] See, for example, the second, or later, report of the Iowa State Teachers' Association on "Elimination of Subject-Matter," Professor G. M. Wilson, Chairman, Ames, Iowa (free); and the reports on minimal essentials by the National Society for the Study of Education, 1915 and 1916, Public School Publishing Co., Bloomington, Ill.

contributing through the public schools to desirable kinds of industrial efficiency [35]. The cities of Springfield, Illinois; Cleveland, Ohio; Ipswich, Massachusetts, and many others, have made studies of their provisions for leisure and suitable educational recreation for young and old.[1] The writer has made studies of how an entire state through its rural schools and twenty-five cities in several states were contributing through the public schools to ameliorate disgraceful health conditions [24 : chap. V]. The needs for education along the lines of citizenship, and the part the schools can play in this prime factor of democracy and freedom have also been given considerable attention in the last few years.

An analysis of social efficiency as the proximate aim of education gives us five phases or specific aims, namely, vital efficiency, vocational efficiency, avocational efficiency, civic efficiency, and moral efficiency. The chief changes which can be made in pupils to help them and their nation or civilization to achieve genuine social efficiency and universal happiness of the highest types are, according to Professor Yocum, also five in number. Children may, of course, be changed, or modified, in their development both physically and mentally. The removal of adenoids and enlarged tonsils and the correction of physical deformities or faulty development may stand as examples of physical changes (not given space in the accompanying charts). The five mental changes or forms of control, according to Professor Yocum, are: (1) *vocabulary*, or knowledge that is barely retained, (2) *varying interconnection*, or knowledge that has taken on many-sided associations varying with individuals, (3) *impression*, or forgotten "knowledge" leaving its impress, including ideals, and appreciations, etc., (4) *specific discipline* ("knowledge") or habits of a specific character usable in particular situations, and (5) *general discipline* ("knowledge") or more general habits due to transfer, such as the ability of a person to drive almost any auto-

[1] Bibliography in pamphlet form published by the Russell Sage Foundation, Division of Recreation.

mobile after learning to drive a few typical ones. This analysis makes each element of social efficiency manifest itself as impression, vocabulary, variation, habit and system, and transfer. "Transfer" will be discussed later under the heading of formal discipline.

A more common and easily understood classification, possibly, is the usual one into knowledge, habits, ideals, and appreciations, using the last term to cover several emotional factors. In these four ways we can change a child's mental growth in the direction of the five phases of the aim of education. For example, mere knowledge about health is not sufficient for making healthy citizens. Pupils must be trained also in definite habits, ideals, and appreciations (including interests, tastes, attitudes, etc.). We use both classifications in the accompanying charts, Doctor Yocum accepting the writer's list of five types of changes instead of seven.

Breaking down the old antithesis between knowledge and power, Doctor Yocum insists that nothing is educational which is not retained as knowledge in the mind of the learner, and that does not result in power—that is, in some form of control over the learner's future experience. The fundamental educational problem, therefore, becomes the determination of the stages or forms in which knowledge is retained, and the corresponding or resulting forms of control. He distinguishes between *vocabulary* and *interconnection* or *variation* control, because they correspond to distinct stages of retention—the bare retention which *through a word* holds an idea in mind with the least possible association with other ideas, and the growing many-sidedness of association, which, *varying* with individuals, makes possible a *varying interconnection* which he contrasts with definite and invariable *habit* and *system*. He fails to include appreciation and ideals as separate controls, on the ground that they are but two among many forms of impression. *Forgotten knowledge*, if it is educational, results in *impression* control through feelings, prejudices, appreciations, realizations, interests, opinions, attitudes of mind, tastes, ideals, and incentives; *partial knowledge* is exercised as *vocabulary* control through the number and kind of words barely retained; *many-sided* and *varying* knowledge makes possible control through the *varying interconnection* of ideas basal for originality and initiative; *definite* and *certain* knowledge functions as *habit* and *system* control; all *general* knowledge may under favorable conditions become still further educational through *transfer* control.

KNOWLEDGE OR FORMS OF RETENTION	FORGOTTEN KNOWLEDGE	PARTIAL OR BARELY RETAINED KNOWLEDGE	MANY-SIDED BUT VARYING KNOWLEDGE	DEFINITE AND CERTAIN KNOWLEDGE	GENERAL KNOWLEDGE
POWER, OR FORMS OF CONTROL	IMPRESSION	VOCABULARY	VARIATION	HABIT AND SYSTEM	TRANSFER
1. VITAL EFFICIENCY	Incentives to healthful inhibitions and interests.	Terminology explanatory of hygiene.	Association with situations calling for hygienic precautions.	Personal and social hygienic habits.	Carrying over of health activities from school to home and personal life.
2. VOCATIONAL EFFICIENCY	Incentives to labor. Interest in occupation sympathy with workers. Appreciation of their independence.	At least partial Concepts of broadest possible vocational terminology.	Moving pictures, stereographs, and stories of industries.	Habits of concentration and application. Selection of situations calling for exhaustive detail.	Paralleling of school work with outside industry, general ideas and incentives to labor.
3. AVOCATIONAL EFFICIENCY	Many-sided tastes and interests in amusements. Literature, art, and interest in a variety of things, a sense of social fitness.	Fine diction. Terms used in discussing the fine arts, and the vocabulary of individual interests and pursuits.	Periods in art. Grouping of masters. Classification of master-pieces. Observation and reading along selected lines.	Polite conversation. Entertainment of guests. Visits to libraries and art exhibits. Making collections and encouraging individual avocations.	Esthetic tastes and social observances carried over from home to school and reverse. Carrying over of observation, analysis, etc., from one occupation to another.
4. CIVIC EFFICIENCY	Patriotic feeling. Civic motives, ideals of democracy.	Civic and legal vocabulary, partially retained and Comprehended.	Trips to Municipal and county offices and institutions. Reports on current events.	Good citizenship leagues, parliamentary organizations, patriotic duties.	Carrying over of school and home ideals and habits to community life and the reverse.
5. MORAL EFFICIENCY	Moral interests, ideals, sympathy, and atmosphere. Interest in social betterment, incentives to social service.	Biblical names and moral terms made definitely suggestive. Philanthropic terms, names of organizations, etc.	Association of ethical ideas with every phase of experience thru selected fiction. Information about organized charities and social needs and observances.	Everyday moral and religious activities. Help to poorer pupils, flowers for the sick, and varied forms of service to others.	Search for new applications of Cardinal virtues and restraints. Individual effort to discover new forms of social service.

PROFESSOR YOCUM'S CHART OF SOCIAL AIMS AND MENTAL CONTROLS

SOCIAL EFFICIENCY	KNOWLEDGE	HABITS	IDEALS	APPRECIATIONS
"THE FUNDAMENTALS" "TOOL SUBJECTS:"	The three R's, how to get on with others, etc.	Skill in reading, writing, speech, spelling, figuring, construction, behaving, self-care, etc.	Ideals of respect for elders, of mastering fundamentals, etc.	Interest in school activities and desire to achieve.
1. VITAL EFFICIENCY: HEALTH AND PHYSICAL DEVELOPMENT	Usable information concerning every day hygiene. Personal, public and vocational hygiene.	Habits of being clean, of avoiding infection, of exercise, of working for public health, of eating right food, etc.	Convictions and enthusiasms concerning personal bodily condition and public health	Prejudices in favor of hygienic conditions and against bad conditions. Healthful attitude and interest.
2. VOCATIONAL EFFICIENCY: AGRICULTURAL, INDUSTRIAL, COMMERCIAL, PROFESSIONAL AND DOMESTIC	Knowledge of industrial conditions, of actual work, and a specific trade. Economics, manual arts, vocational guidance, etc.	Desirable habits gained by doing the work and conforming to demands of the work Home habits and skill gained in home making.	Ideals of honest work, industry as social service, craftsmanship. Ideals of importance and place of mother.	Appreciation of relation of one's work to world's work, right attitude toward associates, etc. Interests in home making, appreciation of relative values, etc.
3. AVOCATIONAL EFFICIENCY: RIGHT USE OF INDIVIDUAL AND SOCIAL LEISURE	Knowledge of games, plays, music, art, literature, and many other ways of harmless wholesome enjoyment.	Habits of harmless wholesome enjoyment, skill in hospitality, conversation, recreation, etc.	Ideals of worthy use of leisure and obtaining leisure for all. Greek ideal of the happy life. Life as a fine art.	Sense of importance of leisure as a part of each day. Appreciations and tastes in right use of leisure. Manysided interests.
4. CIVIC EFFICIENCY: AMERICAN AND WORLD CITIZENSHIP	Knowledge of elementary social sciences, including community civics. Study of lives of worthy citizens.	Training in school and community citizenship. Participation in group activities.	Ideals of contributing to community welfare, of co-operation, leadership, etc.	Interest in community problems. Intolerance of evil conditions in community life.
5. MORAL EFFICIENCY: MORALITY AND RELIGION, INCLUDING SOCIAL SERVICE	Knowledge of practical ethics. Simple sociology. The world as a brotherhood.	Moral habits gained by participation and study of moral conduct in every day social activities.	Ideals of service, promotion of social happiness, honor, trustworthiness, etc.	Dynamic interest in personal and social purity and betterment.

The Educative Process as Individual Means and Social Ends

Statements of the ultimate purpose of the educative process: self-realization, social efficiency, happiness, complete living, achievement, individual and social happiness, life of reason, duty, growth. Dewey's "Democracy and Education" emphasizes growth.

Each form of control may be generally or specifically useful both in the field of general education and specialization.

As Doctor Yocum's controls result from actual stages of retention rather than philosophical or logical classifications, so his five social aims represent a specific educational demand for organized social movements. Religious education associations, denominational bodies, Young Men's Christian Associations, Women's Christian Temperance Unions, and similar organizations demand religious and moral training. Hygiene associations, medical societies, physical-education and school-playground organizations insist upon training for health. The vocational education movement is rapidly becoming dominant through legislation. Education for citizenship is a constitutional justification for a system of public and compulsory education and taxation. Preparation for morality and social service is being popularized and compelled through sociological research and propaganda. A culture that prepares for social intercourse and an avocation that trains for individual leisure are already the aims of the traditional education.

The interrelations of this analysis are expressed by the diagram on page 14.

How Much the Schools Can Attempt.—What physical and health development, and what knowledge, habits, ideals, attitudes, and tastes are of most value to all and to varying groups of children, the limits of close adaptation to community needs, and many similar problems are now being experimentally worked out. Fundamentally, the determinants of the public school are as follows:

I. The nature of American society and its aims: industrial, democratic, heterogeneous, and changing (not static). (Not forgetting, of course, *world* needs and conditions.)

II. The nature of American children: their heredity, their instincts, their habitual and conscious modes of mental development, their physical natures and modes of growth, and their varying individualities.

III. The nature of the American public school then becomes that of the adjuster—free, compulsory, and universal, and supplemental to other institutions and influences.

What the school will or can do is thus seen to be almost boundless in scope. Its eyes are on the perfect or perfecting

citizen and the evolving state, and upon the children who are to make these possible. As the educative influences of other institutions, like the home, church, and business, change, so the school, as a supplemental and state institution dedicated to the common good, must change. No traditional and hard-and-fast preconceptions of its mission, organization, and subject-matter will keep up with its experimental, supplemental, and growing character. The teacher is not a mere drill-master of sacred subject-matter, but a builder of civilization, a maker of citizens who will promote a progressive democracy. The educator is in the first ranks of statesmen, as Plato so long ago foresaw, not a statesman in the sense of leaving the schools for a governorship, presidency, or other public office, as many to-day are doing, but as a creator of the national life through public education. No less a vision of the mission of teaching will long prove satisfactory in America.

Happiness and Democratic Self-Activity.—Taking happiness and natural growth as at least an important element in our view of life, we come to a further principle, emphasizing the worth of the individual, namely, that his happiness and freedom must be provided for in childhood as well as in maturity, so far as is consistent with public welfare, the happiness of the group. The greatest amount and finest kind of happiness, growth, individual culture, and well-being possible within social limitations must be provided for during the entire lifetime of the individual. Happiness for a lifetime requires under present conditions certain necessary limitations on individual happiness, while making preparation, perhaps, and requires also that we teach the young how to find their happiness as much as possible along lines that will contribute most to social well-being and permanent happiness. We need not make school all play and a mere following of instincts which have originated in another more primitive type of life, for the reason that these need guidance and redirection, and that much which is learned as a hardship becomes pleasant with habituation.

But the ideal is, of course, to harmonize natural tendencies and individual and social needs in the most effective, pleasant, and economical way. The best preparation for living happily and promoting general happiness in the future is to live happily and to help promote general happiness in the present. "Education is not merely a preparation for life; it is life." The present satisfying life of children is as desirable to the state as the present satisfying life of adults. The best preparation for any future life is to live well this life. "Life more abundantly all along the way" is a necessary first principle of schools. The goal and the process of education are one.

III. The Program of Studies

Teaching Texts vs. Moulding Community Life.—We are easily appalled by the tremendous social inheritance of knowledge, habits, and aspirations garnered up in books, customs, inventions, and institutions, which it would seem that all children of to-day must gain regardless of individual present happiness. Even as long ago as 1644 John Milton made out a course of study and exercise for the young so extensive that only a prodigy could learn it in a score of years. Since then the curve illustrating the increase of possible and valuable subject-matter has taken an almost vertical direction until to-day one would have to live to the age of a million to encompass a great share of our present stored-up learning. Fortunately, it is not necessary for any one to make this attempt, even though Lord Bacon could in the time of Elizabeth take all knowledge for his province. We must keep our attention focussed on the pressing *needs* of society and the attainment of health, vocational efficiency, morality, citizenship, the right use of leisure, and on the normal growth of the children rather than upon all the *tools* which may be brought to bear to accomplish our educative ends. We must be filled with a sense of the relative values of life and of minimum essentials rather than be obsessed with the teaching of all details of texts and of "covering the ground."

Avocational efficiency for Japanese children in Sacramento, Cal.

Teachers who have looked upon the garnered wealth of the ages as stored up in text-books, as an end in itself, have constantly helped to defeat the aim of the educative process. As in any other constructive work in the world, we should use only those tools which are needed for the greatest efficiency in achieving our purposes—not every tool in the world, but just those of most worth, all things considered. Teachers and superintendents must be pickers and choosers. Just because we possess excellent books on the abstract science of English grammar, for example, we have no reason for using them on American children. Just because "of the making of books there is no end," we have no reason for attempting the impossible task of educating by books alone. Like an artist who with delicate touch selects just those materials which are needed in the creation of his individual art product, so the teacher, principal, and superintendent must select from the storehouse of the world those subtle materials, activities, and experiences which will establish in the children most efficiently the particular "conduct controls" promoting the definite ends of American life.

Minimum Essentials of the Course of Study.—The various conduct controls which we may, through guiding the self-activity of children, help them to build up in such a manner as to insure with considerable probability the attainment of the various social ends such as vital, vocational, avocational, moral, and civic efficiency, will be discussed in the following chapters. According to Bagley's classification, these controls are instincts, habits, knowledge, ideals, prejudices, and attitudes. Professor Yocum makes instincts merely one means to impression, under which he includes ideals, prejudices, and attitudes. He also separates knowledge, as suggested above, into vocabulary and interconnection, and adds transfer to habit. All the activities necessary to the establishment or modification of these various conduct controls in children may well be called the course of study, or the subject-matter, although the latter term usually implies mere book knowledge.

The great number of children who drop out of the elementary schools with barely the elements of the tools of reading, writing, and arithmetic, and the fact that a sound sense of relative values has not always been operative in selecting the subject-matter of the elementary courses of study, have led to investigations and experiments dealing with the elimination of the useless or even de-educative material and with the selection of "the minimum essentials." Between these two extremes of essential and non-essential values lies a third type of activity which is not important enough for drill and general requirement, but valuable in giving general acquaintance with the world in which the students live, and in meeting individual needs. According to Professor Yocum, the main object of the determination of relative worth is the designation for each school subject and educational aim:

> First, of the details so obviously essential in some definite relationships that their permanent memorizing must be compelled by drill;
>
> Second, of those so low in their relative worth that they can be excluded altogether; or designated as not to be memorized at all, and
>
> Third, of those lying between these two extremes which exist in such variety for each degree of relative worth that it does not matter which are chosen, except in so far as they differ in relative likelihood of survival [36 and 37].

Professor McMurry's Standards.—Professor Frank McMurry also suggests standards of elimination that have had considerable influence. He recommends the elimination of details of subject-matter that are not *useful* in the broad sense, that are not within the *comprehension* of the pupils, that are not *interesting*, and that are not capable of being *related* to other details. He says we should eliminate:

> 1. Whatever cannot be shown to have a *plain* relation to some *real need of life*, whether it be esthetic, ethical, or utilitarian in the narrower sense.
>
> 2. Whatever is not reasonably within the child's *comprehension.*
>
> 3. Whatever is unlikely to appeal to his *interest;* unless it is positively demanded for the first very weighty reason.

4. Whatever topics and details are so *isolated or irrelevant* that they fail to be a part of any series or chain of ideas, and therefore fail to be necessary for the appreciation of any large point; this standard, however, not to apply to the three R's and spelling.

In his volume on "Elementary School Standards" [19] he gives the following suggestive bases for judging the relative value of subject-matter to be used in teaching:

1. *Bases for relation of subject-matter to children's interests.* In harmony with the previous discussion of standards for judging the quality of instruction as a whole, the quality of the curriculum in particular is to be determined partly by its tendency to influence the tastes, purposes, and hopes of children. Any curriculum for the elementary school should have its content selected from among those experiences of mankind that have seemed most valuable. This is to be presupposed. But this selection can be indifferent to the tendencies, interests, and capacities of children in general and of certain ages in particular, and aim at only present storage of facts and ideas that may count in a dim future, *i. e.*, adult life. Or it may be made with constant references to the abilities, tastes, and needs of children at the present time. In the former case, motive on the part of children is overlooked; in the latter case, the extent of provision for it is accepted as one of the standards by which the curriculum is to be judged. We hold the latter view.

2. *Initiative evoked in teachers and children.* A further basis for estimating the merits of the curriculum and syllabi is found in their attitude toward the exercise of initiative on the part of teachers and pupils. The syllabi in particular—being an interpretation of the curriculum and in addition containing suggestions on method—may show the subjects to be so attractive as directly to invite attack by children. They may suggest also so many different sequences of topics, and other procedures requiring choice, that they surround both teacher and pupil with an atmosphere of freedom and thus directly favor the exercise of initiative on the part of both. Or they can offer a skeleton so bare that it repels all who behold it; and they can, by offering no options and by repetition, so insist on certain suggestions of sequence and other procedures as to surround the teacher and finally, through her, the pupil with an atmosphere of restraint that tends to suppress all originality.

3. *Organization of subject-matter.* The first great condition of the proper organization of ideas in the pupil's mind is that they be well

organized in the curriculum itself. If they be scattered there, it is too great a task to expect the classroom teacher to establish order among them before putting them before children. One of the first characteristics of a good curriculum, therefore, is avoidance of isolated facts. In general, whatever items of a study cannot form a necessary part of some valuable whole must be omitted; and those that are accepted should have a recognizable place in a series of ideas, with cross relations or correlation with other studies.

4. *Attention to relative values.* Finally, the value of both curriculum and syllabi is to be judged by the emphasis they succeed in placing upon the more vital and real parts of each branch of knowledge in comparison with that placed upon the less important and more formal portions. Every study contains a multitude of minor facts that any one is expected to know, such, for instance, as dates in history, situations of places in geography, and pronunciation and meaning of individual words in literature. These can stand out so prominently as to seem to constitute the body of the study; or they can be so subordinated to what is fundamental that the latter is made to carry the former and constitute the bulk of the subject. To the extent that this latter object is effected the curriculum and syllabi satisfy one important test of excellence.

In a more recent statement Professor McMurry gives more elaborately his statement of the "Principles Underlying the Making of School Curricula." [1] A summary of these principles which have been subscribed to by several prominent educators, appears in the following five points (summary and italics by the editor):

1. "The *subject-matter* for a curriculum should be selected from among those experiences that are *related to life* and are likely, owing to their intrinsic nature, to appeal to the pupils directly as worth while." Thus many phases of subjects have been eliminated because less closely related to the needs of life than others available, and others have been selected or modified to conform more closely to the growing interests, purposes, and motives of pupils. The school must develop in students worthy interests and purposes, and must also give ability in testing relative values from the standpoint of such purposes. Appreciation of such values may be expected to develop as children grow older and are better trained in such discrimination and judgment.

[1] In the *Teachers College Record* for September, 1915.

2. "The best form of *organizing the work or activities* of a curriculum is in the form of *a series of problems*, especially for the more intellectual phases which make up the bulk of curricula." Definite needs and wants form the best basis for the organization of the emotional and motor elements of each course. With these problems for each subject there should appear in the course of study definite data; suggestions, sources, etc., should be provided the teacher. Such organization might be called the *problem-method*, but its use would not eliminate entirely the use of either the topical or the old-type logical organization or use of subject-matter. One problem for a recitation or one problem with its several subproblems for several recitations could thus be arranged.

3. "The *relative importance of subject-matter*, determining its final admission into the curriculum and its relative prominence there, must depend mainly upon its relative importance in social life, and the pertinency of its relations to the purposes of the school." This principle emphasizes the subjects most closely related to the principal needs of the children and people and, thus, the aims of education. For avocational and other aims, for example, games, social activities, fine arts, handicrafts, and music would be emphasized. For vocational and other aims, such problems as good roads, prevention of several diseases, investments, life insurance, care of the soil, knowledge of the various occupations and the opportunities and requirements therein would need to be emphasized. Some of the so-called fads would rise to the dignity of fundamental minimal essentials by the use of such a principle. Whole subjects and parts of subjects now required would be eliminated by the same principle.

4. "The curriculum should make important provision for *easy control over knowledge* on the part of pupils." This would require much overlapping of problems for purposes of review, some use of logical organization, and correlation of studies. These cross relations should be mentioned in the curriculum.

5. "Since every child differs more or less from every other in native endowment, past experience, and present environment, the curriculum should be so arranged as to be in the highest degree *adaptable to each pupil*." We are now familiar with different subject-matter for city and country children, fortunately, for pupils of different ages, for the sexes somewhat, and slightly for different schools in the same town or rural region. Doctor McMurry thinks that the smallest unit for which subject-matter may be planned is the class.

This is one of the few attempts so far made to express explicitly the grounds on which teachers and supervisors may

select and organize the experiences of children for purposes of education.[1] The writer is in general accord with the principles as stated, although he thinks that the social aims of education should be made more prominent, as given on a previous page. In the absence of more definite and objective standards or tests such statements of the principles involved in the selection of the materials the teacher is to use in helping pupils to achieve worthy ends are of much value. They point toward greater definiteness and scientific precision in teaching. They stimulate careful and painstaking examination of the activities in which children engage in school, and will lead to avoidance of much of the "puttering around" and sentimental time-wasting which is so common in many classrooms and schools.

Professor Yocum's Standards.—Professor Yocum criticises Professor McMurry's four standards for elimination, and sets up some of his own. His "more adequate test for total rejection or exclusion of particular relationships from both optional and essential content" is given in the following principles:

> Reject from the general course of study all relationships or phases of the course:
>
> 1. Which are antagonistic to any phase of the educational aim;
>
> 2. Which are not useful to a majority of individuals who are not specialists, or in a specialized phase of education, to the majority of those who are;
>
> 3. Which are either being effectively taught outside the institution for which the course is intended, or which cannot be effectively taught within it.

Combined with principles of inclusion as well as exclusion from the school's activities, we should have the following eight principles, as I gather them from his book on "Culture, Discipline, and Democracy":

1. The aim of education is fivefold, viz., health, citizenship, vocational (including domestic) efficiency, morality and

[1] See also Thorndike's chapter on this subject in *Education*, pp. 121–134.

religion (including social service), and the right enjoyment of leisure.

2. Discard everything which does not plainly and directly further this fivefold aim.

3. Test all that remains of the present course of study or activities of the school, and also all not yet included in the course as to its:

(1) Many-sided applications and usefulness in furthering all phases of the educational aim;

(2) Frequency of occurrence or frequency of need for such training in life;

(3) Emotional appeal, including interest and accord with instinctive and acquired tendencies.

4. Reject all that is adequately taught in other institutions, *e. g.*, the home, industry, or the church.

5. Reject also whatever cannot adequately be taught in a school.

6. Test by number three above all that is thus obtained and collected to ascertain the essential relationships, or knowledge, habits, ideals, and appreciations, that must be certainly established in every individual, the minimal essentials for the majority of pupils, considering well the time which they have for the learning process.

7. Select the less valuable relationships (knowledge, habits, etc.) that may be mastered by pupils in the time at their disposal and organize this optional content so as to:

(1) Meet the needs of the individual,

(2) Permit of specialization,

(3) Meet the needs of the particular locality,

(4) Permit of experimentation and self-discovery along various lines by the pupils.

8. Arrange these two classes of subject-matter, the minimal essentials and the optional or alternative content, so that all will be adapted to the needs and methods of growth of the pupils, to the length of the school year, etc.

Formal-Discipline Theory Absent.—We do not find in these or other modern statements of the principles for judging the quality of teaching or of subject-matter the idea that a certain subject or phase of a subject may be justified because it "disciplines the mind," "develops the power of reason," "trains the memory," "develops the faculty of observation," "concentration," "habit of work," or any other claim of the kind, although Professor Yocum provides for such "general discipline" as is possible. In this they are different from past standards less consciously and carefully derived and applied. We know that training in memorizing the spelling of words, regardless more or less of the necessity of their use in writing, does not develop to any significant extent our memory for other types of mental content. We have pretty well proved that formal grammar as a separate "discipline" and study does not give much mental discipline or ability to reason well in general outside of the science of grammar. Tested by its relative usefulness in developing the specific conduct controls that make for any of the essential values of life, including the use of reasonably good English in speech and writing, formal grammar in the elementary school, in competition for the limited time of the pupils, fails to hold its traditional place.

To a prospective specialist in English or the languages, such as a teacher of the subject or a writer, Professor Yocum's second standard would probably work to keep in the subject of grammar if it could be provided for the one or more specializing without requiring those who are not specializing to take it. The teaching of formal grammar as a special subject would be also somewhat contrary to the first standard mentioned in that it tends to drive pupils from school and uses up the time for others that must be utilized in other ways in order to accomplish in the time available the essential educational aims. A subject may be intellectually interesting to many pupils; it may be of some value; it might be a desirable subject for all persons to know; but if the time which it takes up can be spent to better educational advantage, then it must give way to more effective tools.

High school teachers should try such standards on the secondary school subjects, including the non-English languages and the non-arithmetical mathematics,[1] on the recondite and formal-science courses and the more modern general-science courses, as well as on other subjects not yet well established in secondary school curricula such as those relating to health and physical development, to industrial and domestic efficiency, to citizenship and morality, and to the right use of leisure. The elementary teacher should apply them to all her topics and subjects, and to the school activities not usually considered a part of the course of study. They are of value in selecting as well as rejecting topics and activities within almost any general course of study.

Application of the Various Standards of Selection and Rejection of Subject-Matter.—We may now, for further illustration, sketch briefly the application of these standards to one or more other phases of elementary school activity. Let us take spelling. Doctor L. P. Ayres of the Russell Sage Foundation has recently made a study of the words most commonly used by people of all ranks in their correspondence, or letters, about the only place they need to know how to spell. Five hundred forty-two words made up seven-eighths of all the words used in all of the two thousand letters analyzed! Later he has prepared a spelling scale of a thousand words most commonly used and which probably make up ninety-five per cent of all words used by the majority of plain American people in their writing. (See page 67.) The words are arranged by grades and according to difficulty as found by testing thousands of school children. This set of a thousand words, with a few modifications, will probably become the first minimal essentials of a course in spelling for thousands of school systems in this country. Now what right have we to place these words as required minimal essentials in the common schools of this country? Let us examine them in the light of the eight standards previously given.

[1] See articles along these lines in *School and Society* for January 8 and May 15, 1916, and in *The English Journal* for June, 1916, by the editor.

The average spelling-book now used in schools has upward of eight to ten thousand words which pupils are required to learn. Doctor Ayres found in his survey of the Springfield, Illinois, public schools, that children were being required, as in most school systems, to spell many words which they and the most advanced citizens of their community never used nor needed to use in writing. Eleven prominent citizens were given a test in the spelling of ten words taken from the required spelling lists of the seventh grade. All failed to make a passing grade.[1] The average mark was twenty-six per cent. The words were abutilon, bergamot, dentzia, daguerreotype, paradigm, reconnaissance, erysipelas, mnemonics, trichinæ, and weigelia. If rare occasion had ever necessitated the writing of one of these words, these men had probably used a dictionary. They had no need for burdening their minds with the learning of such spelling. Yet the same school children who were spending much valuable time on such words failed to spell correctly many common words which they needed to know how to spell in their writing, such as *which* and *receive*. The dictionary habit can be developed for the spelling of unusual words. A large proportion of children drop out of school before completing the first seven or eight grades. These thousand words, although omitting some that are necessary, are more carefully and scientifically selected from the vocabularies of children and adults as used in common writing, however poorly, than perhaps any other group yet selected.[2] With these preliminary facts we may proceed to the application of our tentative standards.

From the standpoint of the first two standards we should probably include ability to spell these words correctly in letters, and perhaps another thousand most commonly employed by the majority of individuals, as having a plain and direct relation to the attainment of all or several phases of the educational aim. Communication and recording in writing is an almost universal necessity to-day. The time taken to learn these few hundred words with good methods is not

[1] Page 87 of the "Survey." [2] See list in reference 40.

excessive, and will probably not exclude more valuable acquisitions which could be made in the time required. Most of them can be learned incidentally by the end of the fifth grade. Drill would lower the age.

From the standpoint of its "many-sidedness of useful relationships, its frequency of recurrence of useful relationships, and its inherent sensational or emotional appeal," this group of words ranks fairly high. Writing, and consequent spelling, is required in numerous life situations frequently recurring, and the emotional appeal of the needed subject-matter can be strengthened by providing motivation for spelling in connection with writing which pupils desire to do in communication.[1] For purposes of socialization, democracy and the times demand a maximum of communication to knit people together into a universal brotherhood; consequently we may well encourage more extensive communication by making written communications in letters very easy and habitual for all, letter-writing being a minimal essential of composition.

This list of words also meets the demands of principles four and five, since the words are not being effectively taught outside of the schools except to certain business-college students, proof-readers, printers, and other specialized groups, and they *can* be taught by the schools, largely incidentally, in connection with composition and other work. This group of words may then well be required as minimal essentials in spelling for the elementary school, or the first six grades, while an optional list made up of other words needed in particular localities, and for specialization by various individuals may also be utilized. The group of words thus meets fairly well all the demands of the standards.

IV. Examples of Selection and Rejection of Subject-Matter

Professor Charters's Methods.—A great many individuals and a number of organizations have been at work determin-

[1] See Wilson's "Motivation of School Work," p. 190.

ing the minimal essentials of the course of study for elementary schools. For example, Professor Charters of the University of Missouri made studies to determine what errors connected with grammatical rules were made by children in the grades three to eight in the schools of a large western city, to determine what phases of grammar, if any, should be taught in the elementary schools. The following eliminations from the subject-matter found in the language books then in use were suggested, and the suggestions given on the right below recommended as grammatical factors that will probably be of service in providing children with skill in written and oral English [8]:

ELIMINATIONS

1. The exclamatory sentence.
2. The interjection.
3. The appositive.
4. Nominative of explanation.
5. Nominative of address.
6. The objective complement.
7. The objective used as substantive.
8. The adverbial objective.
9. The indefinite pronoun.
10. Classification of adverbs.
11. The noun clause.
12. Conjunctive adverbs.
13. The retained objective.
14. Infinitive, except split infinitive.
15. Mood, except possibly the subjunctive of "to be."
16. The objective subject.
17. The participle, except the definition of present and past forms.
18. The nominative absolute.
19. The gerund.

SELECTIONS

1. Proper as contrasted with common nouns.
2. The possessives of nouns.
3. The formation of the plural.
4. The inflections of pronouns.
5. Use of the relative pronouns.
6. Cardinal and ordinal numerals.
7. Comparison of adjectives.
8. Verbs as to kind, number, tense, and voice.
9. Adverbs as distinguished from adjectives.
10. Idiomatic uses of prepositions and conjunctions.
11. Placing of modifiers.
12. Double negatives.
13. Syntactical redundance.
14. The sentence as a unit.

(See also his report in reference 40 at end of chapter.)

The suggested eliminations if made would, as in the case of spelling, give much time for work more closely related to

the fundamental aims of the school, such as health, citizenship, industrial and domestic efficiency, etc.

For Arithmetic.—Superintendent Thompson has worked out certain "minimum essentials" in arithmetic, such as the forty-five addition and forty-five multiplication facts which children should be able to use habitually without hesitation in all common life situations requiring such automatic controls. He says that the number of such facts in arithmetic is, when analyzed out, astonishingly small. For example, there would be little more than: "The sum of any two figures when the sum is not more than twenty, the difference of any two figures when the larger is twenty or less, multiplication through the table of twelve, and the reversal of the same in terms of division, denominate numbers, and aliquot parts of one hundred." These facts he has placed on sheets and used for drill, and pupils make a hundred per cent achievement [30].

Principal Maxon of Yonkers, New York, has an ingenious kind of drill device for isolating certain essential habit facts of arithmetic, and for getting remarkable results in rapidity and accuracy in them, entitled, "Self-Keyed Number Cards" [23].

Doctor S. A. Courtis and Superintendent Studebaker have also very helpful practical tests for producing similar results.

The 1915 and 1917 Year-Books of the National Society for the Study of Education are devoted to this important topic, most of the elementary school subjects being treated. Much of the material in these reports is of direct classroom value, and teachers should not wait to have it faintly filter down to them from superintendents. For example, an authoritative table of twenty of the most important dates in American history, worked out by Professor Bagley, for memorization in the seventh and eighth grades, strikes the eye in leafing through the 1915 volume:[1]

[1] See also pamphlet by Professors Bagley and Rugg on "The Content of American History as Taught in the Seventh and Eighth Grades," Bulletin No. 16 of the School of Education, University of Illinois, Urbana, Illinois.

Rank	Date	Value	Rank	Date	Value
1.....	1776*	1,323	11.....	1812	752
2.....	1492	1,261	12.....	1765	629
3.....	1607	1,363	13.....	1783	618
4.....	1789	1,100	14.....	1865 (Apr.14)	389
5.....	1620.....	961	15.....	1850	591
6.....	1803	955	16.....	1854	590
7.....	1861 (Apr.14)	901	17.....	1775	585
8.....	1787	821	18	1781	584
9.....	1863 (Jan.1)	808	19.....	1823	521
10.....	1820	793	20.....	1846†	470

* Most important. † Least important.

A "Committee on the Elementary Course of Study" has published a Bulletin through the Minnesota State Department of Education (Saint Paul) in which it has also attempted to state minimal essentials in elementary school subjects.

The Iowa State Teachers' Association published extensive reports on "Elimination of Subject-Matter," in 1915 and 1916.[1] This committee recommends from *arithmetic* the elimination of: formal number work in the first year, the greatest common divisor, complex fractions, fractions with large denominators, puzzle problems, long process of division of fractions, decimals beyond three places, Troy weight, apothecaries' weight, surveyor's measure, table for folding paper, tables of foreign money, reduction of compound numbers beyond two or three places, complicated and imaginary problems involving percentage, more than one method of finding interest, annual interest, true discount,[2] partial payments,[1] partnership with time, foreign exchange, compound proportion, cube root, metric system, and a number of other topics. Topics to be emphasized are also given.

Other reports are to be found in these volumes on: language and grammar, writing, geography, hygiene, history, and spelling. These are of the greatest value to teachers and superintendents.

[1] Obtainable free of charge from Professor G. M. Wilson, Ames, Iowa.
[2] Modified somewhat in the second report.

In general, there are certain fundamentals in education for a democracy like ours which we should be determining. The teacher will profit in many ways by such selection. Since she is now overburdened with a jumble of subject-matter, her burden would be lightened; wise selection and organization on scientific and social grounds would help her teaching; tests of her work would be much fairer, since they would test for essentials which she would know in advance, whereas at present she too frequently has little chance of learning the requirements except by studying the personalities of the supervisors and examiners; she herself would also use at all times the same standards as her superiors in judging relative values. The school need not thus become more mechanical, since more time will be available for other types of teaching exercises than drill, and drill would become more meaningful. The values of life are the final standards, and these each teacher must, in her own community and in her own country at large, assiduously study. Personal, first-hand acquaintance with the problems which the plain people of her community meet day by day, and acquaintance with the types of life toward which they are more or less blindly striving, are necessary for her own more ultimate standards. All three methods of determining the essential school activities should be utilized: (1) by applying the five great aims of education, (2) by studying the needs and problems of the people, and (3) by using objective scales and standards, as in writing and reading.

Later chapters will emphasize this social relationship of the teacher in connection with the suggestions for selecting and teaching the elementary school subjects.[1]

[1] Other chapters on "The Learning Process" and "The Teaching Process," by the editor, were excluded because of lack of space and are to be found in *American Education* (Albany) from February to June, 1917, in series. Reprints obtainable from the editor.

SUMMARY

1. We as teachers need to view ourselves professionally and take steps which will make our profession more than a mere trade.
2. A more critical and scientific spirit is leading education to firmer ground on which definite aims can be ascertained.
3. The problem of education is to promote growth and social happiness through social efficiency—to help people solve the problems of life.
4. These problems may be classified into five main groups and stated as phases of social efficiency to be developed, namely, vital efficiency, vocational efficiency, civic efficiency, moral efficiency, and avocational efficiency.
5. The changes which can be made in individuals to help them meet these ends are both physical and mental. On the mental side the chief changes are those in knowledge, habits, ideals, and appreciations. These aims and changes give us certain standards for guiding education. Doctor Yocum classifies the changes differently.
6. The determinants of educational policy are fixed also by the nature of American society, of American children, and of the American school itself.
7. We need ability in selecting those activities and those phases of subject-matter which are most educative.
8. Professor Frank McMurry and Professor Yocum have both attempted to give us standards by which to select and reject subject-matter.
9. Professor McMurry's standards state that those phases of subject-matter are most valuable which best meet the aims of education, *i. e.*, are most clearly related to the needs of life and which appeal most to the pupils as worth while. Professor Yocum would add to these two principles a few others.
10. The theory of formal discipline should not be used as a standard for judging the value of subject-matter.
11. The standards when applied seem of value in the selection and rejection of subject-matter. The five aims, the common needs of people, and objective standards of achievement should all be used in determining the essentials.

PROJECTS IN APPLICATION

1. Make a list of the minimal essentials in knowledge, skill, and ideals which a girl and a boy should have at the end of the sixth year. At the end of the eighth year.[1]

[1] Boston public schools have made partial lists.

2. (*a*) To what extent can we depend upon valuable, formal mental discipline from the study of subjects or parts of subjects which we do not need in life? (*b*) What are the leading articles and books on this problem? (*c*) If you can, get up a debate, half of your class or study group taking one side and the other half the other.
3. What would you have to put into your school activities to develop more effectively the type of men and women you need in your community?
4. Do the people of your community regard well-used leisure as an end for which education is desirable? Do they have sufficient leisure, and do they use it well? How can your school best help to meet this problem for old and young?
5. How much time can be saved pupils in arithmetic by excusing from drill on essentials those who have attained a reasonable standard and by giving other work or recreation to them?
6. If you were in a rural community how could you learn what types of arithmetic problems the people most needed preliminary school help in solving? (See Thomas' "Rural Arithmetic.")
7. Send to the U. S. Bureau of Education, Washington, D. C., for a list of its bulletins. On this list check those which you consider most valuable. Send for some or all of them.
8. What are the leading educational magazines? Which two or three would be most helpful to you as a teacher, and how much do they cost a year? Send for sample copies.
9. Make a list of the schools or systems which seem to-day to be best adjusting the schools to the needs of children and their communities.
10. Make a list of principles or standards of your own for judging the relative value of different subjects and topics. How do you differ from Professors McMurry and Yocum?

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CHAPTER II

THE KINDERGARTEN AND THE ELEMENTARY SCHOOL

Preliminary Problems

1. To what extent is the education of a child to be based upon the instincts, native tendencies, and impulses developing at his particular age?
2. What are some of the most fundamental interests and significant native tendencies, or instinctive activities, characteristic of children from three or four to six or seven years of age?
3. What use has been made of these natural resources in the average kindergarten or first grade of the elementary school?
4. Should the kindergarten emphasize very much the preparation of the children for success in the primary department of the elementary school?
5. Froebel said that the child should live to the fullest the stage of development he was in. Does this modify your answer? Why?
6. Are all the children of the average kindergarten in the same stage of development? In what ways are they alike and different?
7. To what extent does the first-grade teacher consciously build her work on what has been done in the kindergarten?
8. Is the child put through a prearranged scheme of activities in kindergarten and first grade or are the activities and the natural growth of instinctive tendencies directed toward social aims? Which school seems more natural and educative as tested by the five previously-mentioned factors of social efficiency?
9. Should the kindergarten curriculum of activities be modified to meet the needs of the particular children, the particular community, and the general social environment of the children? Or should the kindergarten be the same everywhere?
10. What data can you find which prove whether children who have had the kindergarten training succeed better in the elementary school than children who have not? How can the percentage of successes be raised?

I. The Evolution of the Modern Kindergarten

The Froebelian Kindergarten.—The kindergarten in its first days was not a system. The experimental child study carried on by Friedrich Froebel between 1805, the year of his first teaching experience, and 1852, the year of his death, was constantly directed toward the formulation of principles, not of practice. In this "pre-formal" period the greatest emphasis was laid upon the necessity for constant companionship with children, in order that the first dawnings of power and interest might be noted by the teacher and used as the foundation of all instruction and training toward the social aims of education. In Froebel's writings we are brought face to face, again and again, with concrete situations in which some child is meeting with an experience, slight in physical character, but deep in its significance for educational growth and social progress.

A child has found a pebble. In order to determine by experiment its properties, he has rubbed it on a board near by—it is a fragment of red stone or chalk, and he has discovered its property of imparting color. See how he delights in his newly discovered property and how busily he makes use of it. A new world opens within and without, for what man tries to use he begins to understand.

"Let it lie," the vigorous youngster exclaims to his father, who is about to roll a piece of wood out of his way. "Let it lie, I can get over it." The healthy boy, brought up simply and naturally, never evades a self-found obstacle, a difficulty; nay, he seeks it and overcomes it.

Would you, O parents and educators, see in a picture what I have here indicated (the value of self-activity), look into this education room of eight boys, seven to eight years old. On a large table of this much-used room stands a chest of building-blocks—the finest and most variable material that can be offered a boy for purposes of representation. Sand or sawdust, too, have found their way into the room, and fine green moss from the last walk in the beautiful pine forest. Each has begun his own work. Now, each has finished his work, each one examines it and that of the other boys. Who can point out the varied significance of these plays of boys? [1]

[1] "Education of Man," Friedrich Froebel.

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The school at Keilhau was noted for all the characteristics one would expect, as the result of such sincere and earnest child study. A strong family spirit prevailed, bringing to the intercourse of the teacher and pupil the informality of comradeship and mutual confidence.

The key-note of the daily program seems to have been spontaneity and flexibility, rather than guidance and formality, and was designed primarily to lead children to the self-discovery of their own powers, through giving them experiences which would stimulate self-employment along educational lines. The child's fundamental instincts were made the starting-point of all adult plans. The play spirit was given opportunity for suitable expression, and thus aroused the creative spirit; the instinct of curiosity was used as the stepping-stone to useful knowledge, not formal instruction by adults; the social instinct was deepened into rational ethics. Instruction was, first of all, made vital, whether it were in tilling the ground, learning a song, building a structure, or the assimilation of facts of physical science. In this experimental school Froebel proved his ability to master elementary school problems, even before he had fully grasped the possibilities of the kindergarten.

Period of Emphasis on Formality or Type Experiences.—In what way extreme formality and the overemphasis of symbolic rather than concrete experiences crept into kindergarten methods is one of the complexities of history which it is almost impossible to unravel. Suffice it to say, that fifty years after Froebel's death, we find a system grown up, rigid in its adherence to line and form, inflexible in method, and exclusive and autocratic in its philosophy of education. The chief characteristic of this type of kindergarten was that of all formal schools—too literal a belief in the "universal" or "type" child, to whom "universal" or "type" experiences can be given in a prearranged series of exercises. Froebel did recommend certain types of experience as being fundamentally stimulating to a child's mental growth, viz.: nature

Doll furniture made by children for their play corner. Experimental kindergarten at Teachers College

Playing tea-party in dramatizing home activities

study, block-building, paper construction, stringing, weaving, language lessons, etc., and immediately after his death, the systematization of the kindergarten "program" or "curriculum" began. As years went on and the system of work became more and more perfected, the social, psychological, and physical needs of individual children dropped from prominence, and we have, instead of the provision for free, spontaneous, personal reaction which characterized Froebel's school, a set form of procedure which was insisted upon in all kindergartens regardless of environment or individual stages of development.

Along with and closely related to the formality of this period grew an increasing emphasis on the symbolic, rather than the scientific, approach to truth. Froebel based his educational principles on the deep and solemn philosophy of the essential unity of all things and sought to discover and disclose mystic laws, which might resolve all variation and manifoldness into final union. That part of his writings which most concerned itself with this search was made the groundwork of all kindergarten training and led, like the fanatical use of all fine-edged tools, to the destruction of much of the real truth underlying the sometimes excessive symbolism of Froebel's philosophy. It is easy to understand how, given a belief in the "universal" child as the being to be educated, and a belief that all human experiences can best be understood by isolating them from their concrete surroundings and presenting their inner meaning through the abstraction of symbolism, the kindergarten grew further and further removed from real child life and social needs and failed generally to correlate its work with that of the school system in general. Dewey's criticism in "Democracy and Education" is in point.

Return to "Pre-formal" Period.—A return to the "*pre*-formal" period is the intense desire of those kindergartners to-day who wish to see in the kindergarten a kinship with modern aims and principles of education. This desire has

come about (1) through the stimulus of the child-study movement and (2) through the growing emphasis among educational thinkers on the need of preserving in the coming generation individuality and responsibility of thought as the most efficient guide to social action. The kindergarten in its original state was in advance of the elementary school in its emphasis on child study rather than on the subject matter of the curriculum. However, when the child-study movement swept over America, fifteen years ago, the elementary school accepted the new point of view more readily than the kindergarten, which was then in its most formal period. In the last few years an effort has been made by many kindergartners to drop the old forms and put the individual child's need in its rightful place—at the centre of educational effort. This has resulted in the establishment of two schools of kindergarten practice, the "new school" in the kindergarten corresponding to the "new school" in elementary education.

The cardinal doctrine of this new school is the thesis that children do not all develop at the same rate or in the same way.[1] While certain characteristics are common to the majority of children at a given age, certain other individual characteristics show themselves according to environment and must be reckoned with if a child is to be developed up to his native possibilities. For this reason the kindergartner of the new school would base her program on *problems* rather than prescribed subject matter—such problems as will allow for individual reaction on the part of the children, thus giving her a clew to their individual powers and interests. Returning then to Froebel for her educational philosophy, she will found her scheme of work on the child's desire (1) to create self-actively new forms, (2) to gain self-actively new knowledge, (3) to communicate and share in a social world. The approach to poetic and symbolic meanings in experience is made through the concrete rather than the abstract, though the new kindergartner does not minimize the lasting

[1] See "Individuality," by E. L. Thorndike (Houghton, Mifflin Co.).

effect of beauty and poetry of feeling in the life of a little child. She maintains, however, that the poetry of life can only be felt through living, not through seeing.

II. What is a Kindergarten?

A Place for the Study and Utilization of Native Tendencies.—The child brings to the kindergarten a store of native tendencies to action, some racial, some individual. The teacher should bring an intense interest in these dawning manifestations of power, some scientific knowledge of the psychology of childhood, a scientific attitude of watchfulness rather than of acting on preconceived judgments, and a skill in the choice and use of all materials which will provide stimuli for growth along right social lines.[1] The educator and the "being to be educated" have, from time immemorial, brought these contributions to the teaching and learning process, and it is their vital interaction which makes a true kindergarten or any other department of school life.

General Native Tendencies Present at Kindergarten Age.—Among the general native tendencies which one may look for in kindergarten children, placing first and foremost those most significant for early education, are these:

Play.—The spontaneous, exuberant, unreflective response of children to their environment; the self-active representation of the inner child through inner necessity and impulse (Froebel); the means whereby the young of a species indulge joyously in those activities which prepare them physically and mentally for future life (Groos); activities which may readily be guided toward the great aims of education, in general, social efficiency.

Constructiveness.—The impulse to transform physical material in such a way that the new form represents adequately to the little creator the embodiment of a mental im-

[1] Emphasized also by Montessori. See Kilpatrick, "The Montessori System Examined."

age best expressed in that form. The desire thus to transform material is strong in little children, and is obviously a great educational force.

Imitation.—The impulse to learn from others' successes than from personal experiment. This is of educational value, of course, in all modes of learning in which the prime object is standardization rather than individuality of reaction.

Added to these are the following: fear, anger, curiosity, affection, sociability, shyness.[1]

These general native tendencies, though they appear in all normal children, are not always prominent at the same age. The distinction between "chronological age" and "mental age," which is so marked in modern discussions of retardation, refers purely to this point: development in the human race along common lines is uniform in character, but not in rate of speed. The vital point at issue, therefore, is not the recognition that strong racial characteristics do appear and are potent forces in education, but that the greatest care must be taken to ascertain their period of greatest strength in an individual, and at that time provide stimuli which will turn these forces of nature to the furtherance of useful learning, instead of letting them lie fallow and die away from inanition.

To counterbalance the impulse of fear by the impulse to investigate; the impulse to withdraw shyly from strangers by the impulse to share experience with companions; and to deepen the impulsive affection into real "social service"—these are the problems for the study and solution of which the kindergarten finds its excuse for being.

Laws of Growth.—Whatever promotes the right development of children, whatever makes them grow, whatever makes them more fit to go on to the next step in the educative process, this the modern kindergarten stands for, accepting as its basic rule of procedure the following summary of Froebel's laws of development:

[1] See Thorndike's "Original Nature of Man," Teachers College publications, and Dewey's "School and Society," University of Chicago Press.

Montessori class, Quiapo elementary school. Bureau of Education, Manila, P. I.

1. Every organism develops in accordance with the highest and simplest laws of life.

2. Every organism develops in accordance with its own individual nature, and in conformity with the specific laws of that nature.

3. Every organism develops under the collective influence of all surrounding organisms.

4. Each successive stage of development does not exclude its predecessor but transforms and ennobles it.

III. What the Kindergarten Is Trying to Do

Its Connection with the Primary Grades.—There was a day when the one test of the kindergarten was whether kindergarten children fitted into the primary grades, without undue readjustment to school values and methods. The criticism of the poorest grade teacher was sometimes accepted as condemnatory of the entire system, and the kindergarten was hated or loved according to its relation to the primary grades. Though we have outgrown this position, it is becoming more and more the wish of all concerned that the kindergarten and first primary grades might be so established on the common basis of the psychology of the ages from five to eight that the step from kindergarten to the first grade need not be a pedagogical break. The integrity of the entire school system demands that "each successive stage of development shall not exclude its predecessor, but shall transform and ennoble it." To know truly any stage of development demands a knowledge of that which came before and that which will come after. The student in the kindergarten training-school makes a study of the nursery period; she should just as exhaustively make a study of at least the first grade, and preferably the first three grades. The *primary* teacher is keenly alive to the problems of the grades immediately about her; she should study just as carefully the pedagogy of the kindergarten. The child who presents himself to her for instruction has probably been under its

influence for at least a year, and to break away completely from a previous line of training always involves a great waste of energy and a suppression of many budding powers. The kindergarten does not represent a complete cycle of training from which a child can be graduated into the primary grades a finished product, but tries to provide an environment which will arouse and start into the right path all activities which ought to prove valuable to later education. The kindergartner, herself, has often chosen her environment with too much regard to "universal" values, but with too little regard to particular needs of individual children. On the other hand, the primary teacher has often planned her school environment with complete indifference to, or ignorance of, what has been begun in the kindergarten. Both have frequently failed to keep in mind the great fivefold aim of all teaching. If we must, for administrative reasons, have cycles of training in our educational system, let us, for pedagogical reasons, divide these periods according to psychological development and community needs, instead of according to subject matter, thus making the ages from five to eight or twelve a unit instead of those from six to fourteen, as is now the custom. This would tend to make continuous and natural the educational development of the child from the pre-school period on through the elementary and high school.

IV. The Preparatory Value of the Kindergarten

The Kindergarten as a Preparation for Life.—It is undoubtedly true that the kindergartner has some justification for claiming that she "prepares for life and not for the next grade." The naïveté of this claim lies of course in her arrogating to herself the exclusive right to this great preparatory function. Nevertheless, she is right when she claims early education as the foundation of the physical, mental, and moral character of the youth and the man. The man needs a healthy body, a clear mind, and a right spirit. The prep-

aration for these cannot be begun too early in the life of any individual.

Hygiene.—"The physical finding of self is as significant for the first stage of development as the moral and religious equipoise is for the highest stage—as much as possible the child's strength must be drawn into play, so that his limbs may be trained into use, his strength exercised and increased —he should learn to use his bodily strength and the activity of his limbs for definite purposes" (Froebel).

The hygiene of physical growth is a matter of the proper exercise of the limbs, lungs, senses, and digestion. It should be the kindergartner's first concern to provide proper hygienic conditions, to establish adequate health and medical supervision, and then to insure that there is constant exercise of hygienic action. If she will lay in the kindergarten a foundation of "hygiene consciousness" (ideals and appreciations), "hygiene habit," and knowledge of hygiene, she will lay the foundations of healthy manhood and womanhood.

Habits.—The place of formal, drilled-in habit in the kindergarten is small in comparison with other activities, but the value of automatizing certain forms of reaction is of course apparent. Such are those routine acts of our lives which are to be uniform day by day, and in which individual reaction is not especially desirable. Personal habits of posture, of cleanliness, of correct speech, etc., "professional" habits which contribute to the daily economy of life in a big group (following the leader, keeping relative place constant, mechanical handling of materials, passing to and fro, etc.), these all help to lay a basis for future efficiency in school and probably in life. The habits formed in the kindergarten should be largely the beginnings of those to be continued in the best elementary schools.

Learning to Think.—"Conscious inquiry is the key-note of reflective thought. To lead the thoughts of children growing up unconsciously and without reference to the attainment of correct belief into conscious inquiry into the nature, condi-

tions, and bearings of the belief,"[1] this is one of the developing functions of the kindergarten. By his struggles with problems involved in the use of material, by the solution of the many little social problems, by the logical connection of imaginative stories leading to a climax, children gradually learn to suspend their impulsive immediate reaction to stimuli until a mental balance has been struck between two possibilities, and thought is begun. To give children definite problems to work out largely by themselves, testing their own tentative solutions, and coming to their own conclusions, is to promote the development of ability to think along many specific lines and, somewhat, in general.

Right Emotional Attitude Toward Learning.—To open a child's eyes to the attractiveness of "knowledge" is to bring into his life an everlasting joy. The sluggish acceptance of new facts is the greatest hindrance to their use in life, and sad is the day when "children creep unwillingly to school," but "go storming *out* to play." Is learning a depressing thing in itself, or is the child a being constitutionally opposed to the reception of new ideas? The kindergartner says "neither!" and in the strength of that denial weaves around all learning processes an atmosphere of eagerness to receive, to understand, and to do. This attitude of happy interest toward learning should deepen later into the absorption of the worker who is an artist in whatever he does because he loves his task.

Kindergarten as a Preparation for School Life.—The kindergarten prepares, of course, most directly for the next step in the educational system—the primary grades of the elementary school. Its connection with the primary, as suggested, can only be vital when both kindergartner and grade teacher look at the education of a little child from the same point of view. The "new" kindergarten does not prepare a child for the "old" primary curriculum and the "old" kindergarten does not prepare for the "new" primary cur-

[1] Dewey, in "How We Think" (D. C. Heath & Co.).

Playhouse made by children from large floor blocks. Department of Kindergarten Education, Teachers College, Columbia University, New York

The use of the same blocks for doll houses

riculum. We must ask ourselves, then, when correlation between the two seems a failure, "Is the fault in the kindergarten of that particular school, or in the grades, or *both?*" Wherever a primary teacher has not heard the great child-study call the best kind of kindergarten preparation will not fit into her system of teaching. The great problem for both is to reach a place where they are not system-ridden. Both must regard education as a process of "*providing experiences which will render future action more socially efficient and fine.*" All experiences and methods which do not contribute to this end must be dropped from school life. All experiences which do so function must be correlated both as to matter and method, so that there will be no waste of readjustment in passing from one grade to another.

V. The Specific Preparatory Value of Typical Kindergarten Activities

In citing the specific preparatory function of kindergarten activities, one can here only briefly summarize their value as experiences, while emphasizing strongly that the most distinct contribution which the kindergarten makes to education is in method, not in subject matter.

Constructive Occupations.—The constructive occupations provide for socially directed growth in many ways. To the expressive, exuberant child bubbling over with spontaneous activity, they bring about a narrowing and steadying of his purposes in harmony with the limits of his material; in the inexpressive child they stimulate an impulse to produce new forms, to create. They are valuable as a disciplinary agency, *i. e.*, the child learns to adapt and regulate his own thinking to the limits of his material and problem; he learns to follow others' plans, to take directions and suggestions both from his teacher and fellow pupils; he learns to persist in finishing a task, to hold the image of the completed project steadfast until it assumes the appropriate form. He gains ideals of

form, both specific and relative; he gains an elementary knowledge of such fundamental mathematical concepts as magnitude, proportion, number, etc. He gains, above all, an independence and originality in making his own plans and carrying them through.

English.—The child comes to the kindergarten not as a "tabula rasa" upon which the moving finger of the teacher can write what she will, but as a being who has already gained more kinds of experience fundamental to his future in a civilized society than he will ever again acquire in any other four to six year period in his whole development. He is full of the "beginnings of things." One of these fundamental beginnings is language. He already knows the force of language as a medium of communication with his world, and he also knows how wofully it sometimes fails him, when he most needs it as a clarifying medium. The conversation period of the kindergarten usually carries a child through three distinct stages of growth in language ability. First he learns to listen, then to respond, then to contribute. The whole process makes a co-operative cycle on which the entire problem of intercommunication rests. To follow another's language expression intelligently, to respond in a way which will further the train of discussion, and finally to make one's own language power a distinct contribution to the subject —this is the acme of linguistic ability. The kindergarten can do much toward furthering this line of growth. Where the language habits of the home are incorrect the problem is a double one.

Receiving the thoughts of others through the printed page is almost as much of a problem as the first tottering efforts of spoken language. New symbols of communication in new relations must be mastered. The kindergarten could do much more toward preparing for this than it at present attempts. The steps toward reading might tend something as follows: (1) A story told, dramatized, and "lived"; (2) the same story told in picture form, the recognition that a flat piece of paper

can communicate experience; (3) the same story read aloud, the teacher casually pointing to prominent portions of the text and saying, for example, "this tells me just what Harry said," or "this tells what Mary found in the forest"; (4) a new set of pictures which can best be interpreted by a printed sentence below each.

We have gone far enough to show the progression from purely auditory language to the recognition of the possibilities of printed language. During the latter half of the kindergarten year, the teacher should draw the children more and more to feel the importance and attraction of printed words, and thus make them fully alive to the function of reading before the formal steps of the first grade are taken. The formal teaching of reading in the kindergarten is probably not to be emphasized; but the placing of rhymes, short stories, etc., about the room, accompanied by pictures, will result in the children gaining a respectable reading vocabulary, as the incidental outcome of their story work. Simply as an outcome of the play and curiosity impulses, many children learn reading in good homes at kindergarten age.

Games.—The function of the game in the kindergarten is identical with the purpose of all games, whether of the Greek, medieval, or modern period, namely, to provide for growth in bodily control, in mental self-control, and in the subordination of individual desires to group success. The organized game aims to carry the child from the period of impulsive physical expression in random, excess movements to the period when, so perfect is the co-ordination of mind and body, the boy or man can use his physical power unerringly in a given direction. The kindergarten game begins this organization of impulses. In order to lay the proper foundation for this process of development it should have (and does have, theoretically at least, in one game or another) the following characteristics:

1. It should provide for *rhythmic expression.* The deep-seated pleasure in rhythm brings about the repetition neces-

sary for growth in power and provides one of the "*pleasure values*" so stimulative and desirable for the growing child.

2. It should provide for *physical growth and control* through graded exercises demanding increasing skill. An instance is in the ball plays of the kindergarten. A little five-year-old child often cannot catch a ball when thrown to him. He learns through the happy game period to toss it himself and catch it, to throw it against the wall and catch it, to throw it at a mark, etc. The growth in skill should be a steady progression in skill of arm, skill of hand, skill of limbs and body. A fault of the kindergarten games in the past has been, perhaps, too much complexity of illustrative material, and not enough difficulty in the physical exercise accompanying them.

3. It should provide means for spiritual *self-expression*. The little child is not a physical being only. A great part of his play is representative of his mental and emotional life. He delights in expressing in pantomime imaginary episodes, not for the sake of the activity but for their representative value to him. This expression will later in his life take the form of a picture, a poem, or an oration. Now it is often a movement play, which communicates to others his inner life of thought and feeling. The game period of the kindergarten gives opportunity for the free "trying-out" of these expressions, under the stimulus of understanding, but critical, companions and thus helps to regulate and organize into a coherent whole what often begins as an incoherent jumble of expression.

4. It should provide opportunity for *growth in the two great civilized virtues—social co-operation and social competition*. The organized game in which individual power is matched against individual power promotes a healthful desire to improve one's own ability, and the game in which one's power is of use only in the interests of a whole group is one of the stepping-stones to social co-operation.

It is obvious that what is here required of the kindergarten game, is equally necessary in the games of later school

life. The activities of the kindergarten are merely the first steps in the process of school development.

Art.—How insignificant seem the little child's artistic powers, yet how big in promise; for he has in himself the groundwork of all true art, the desire to express his personal convictions in outward form. His failings are many—not only does he lack hand power, but he has not the artist's eye, nor even the photographer's. He chooses badly from an adult point of view. His medium and his thought bear no artistic relation; he selects parts of an experience which are least capable of artistic expression. And yet, in the midst of all his crudity he has the true spark of the creator, which we must do all in our power to preserve and develop. Not to make him think his worst effort expresses nothing to us, but to make him conscious of the fact when his best effort does really convey the thought or emotion he meant. He must learn that some kinds of experience are best expressed by color, some by formal line, some by dashing suggestions, some in paper, some in clay or sand. All of these types of artistic work he will bring spontaneously to the teacher. Her problem is to see with his eyes before she tries to lead him from his chosen medium to one more in accord with the conventional canons of art. If the kindergarten teacher can make a child go a little beyond surface perceptions and can show him something of the relative possibilities of clay, water-color, crayon, paper, etc., as mediums of expression, she will lay a good foundation for the training in technic which later school life will give. The primary teacher must remember, however, that the kindergartner has laid most emphasis on the expressional side of art, and the kindergarten child comes to the grades with a firm conviction that he can express a meaning even with his crude handling of art materials. She must beware lest she take away that conviction. This gone, interest in technic wanes also; this preserved, she has on the side of art expression all the force which pleasurable interest and initiative can give.

Science.—

"There was a child went forth every day;
And the first object he looked upon, that object he became;
And that object became part of him for the day—or for many years, or stretching cycles of years.

The early lilacs became part of this child
And grass, and white and red morning-glories, and white and red clover, and the song of the phœbe-bird.
. . . . . .
And the noisy brood of the barnyard, or by the mire of the pond-side,
And the fish suspending themselves so curiously below there—and the beautiful curious liquid,
And the water-plants with the graceful heads—all became part of him.
. . . . . .
And the apple-trees covered with blossoms, and the fruit afterward, and wood berries, and the commonest weeds by the road:
. . . . . .
The hurrying, tumbling waves' quick-broken crests slapping,
The strata of colored clouds, the long bar of maroon-tint away solitary, by itself—the spread of purity it lies motionless in,
The horizon's edge, the flying sea crow, the fragrance of salt marsh. . . .
These became part of that child who went forth every day, and who now goes, and will always go forth every day."

The school can have no higher function than to bring to a little child's consciousness the wonder and beauty of all that goes on about him in the physical world, brought out so suggestively in the above lines from Whitman.

VI. Conclusion

Conclusion.—The following quotation expresses well, in conclusion, the function of education as a process of dealing with various levels in growth.

At whatever level the pupil may arrive, everywhere he finds a world of things around him, which means nature to him; a world of men, which means society, and, third, he finds himself. Each of

these three worlds of experience will become richer and richer. The things with which the infant deals are near his hands, and they grow and grow until, in the experience of the adult, they have been enlarged into the world of the astronomical universe. The fellow-beings whom the child meets become embedded into a larger and larger society until, in the experience of the adult, they have grown into the whole of mankind. Finally, the experiences which refer to the self are, in the infant mind, vague sensations, and they develop until they represent the whole richness of a moral personality.—(Clodd.)

What we wish is a knowledge of the best means for promoting growth, whether that knowledge comes from Froebel, Montessori, McMurry, or Dewey. To adequately fulfil the conditions of progressive development, the kindergarten and primary department must be reorganized, not merely for the establishment of more cordial supplementary relations, but for forming a real unit of education upon the basis of the child's nature at the stage of growth between five and eight years.

The following statement of aim, taken from the catalogue of a kindergarten training-school, is significant of the general trend of feeling which it is hoped will culminate in more decisive action than has yet been taken.

The kindergarten and primary school, springing from different roots, have long been separated in spirit and purpose. This fact is now widely recognized as a misfortune to the child, inasmuch as he undergoes no radical change at the age of six years corresponding to the pedagogical differentiation between kindergarten and primary school. Indeed the age of infancy, considered to be a unit for educational purposes, embraces both the kindergarten and the primary grades. Hence the crying need for the re-establishment of both kindergarten and primary education upon the common basis of the child's nature, not without reference to historical development, but untrammelled by tradition.

The same five aims of education, and the same four or five types of mental changes which we can make in pupils, and the laws of producing these changes, stated in former chapters, must be followed in the good kindergarten as in all other phases of the educative process.

SUMMARY

1. The original kindergarten and the spirit of Froebel were experimental, investigative, flexible, and dominated by the desire to direct the instinctive, "natural" tendencies toward social aims.
2. The kindergarten after Froebel's death, however, degenerated into a very formal institution imitatively enacting something of the letter of Froebel's method but not its spirit.
3. The modern kindergarten would make the school a growing institution, progressively adjusting itself to the nature of the children and the nature of society.
4. The kindergarten is a process of guiding the natural child during certain years in the direction of the great social aims.
5. It is trying to help make the life and growth of the child before, during, and after the kindergarten period a natural, effective, and unbroken unity.
6. The kindergarten is to prepare for social efficiency in the later schooling and the life without the school.
7. This preparation can be made natural and effective through the right use of constructive occupations, English, games, art, science, attention to hygiene, and other activities.
8. The kindergarten, the elementary school, and the home can provide happy, growing, efficient lives for children when they become dominated by the same purposes and methods and vigorously try to co-ordinate their efforts.

PROJECTS IN APPLICATION

1. Make a list of the native tendencies or instincts developing most rapidly at the kindergarten primary period.
2. Select from this list the ones which seem to you to have the greatest educational value, as natural resources, and cross out those which should be starved or eliminated by substitution.
3. Make an attempt to use these best instincts for one day, and see how far your day goes more happily for both teachers and children.
4. At the end of a day try to look back over your teaching to see how many times children were punished and corrected for giving expression to instinctive activities which the teacher did not know how to use or guide.
5. Make a list of those decisions, those plans, and projects which the teacher made for the children, which a better teacher would have stimulated the children to make for themselves.

6. What literature on the kindergarten is published by the U. S. Bureau of Education?
7. What are some of the most progressive kindergartens at the present time?
8. For what do they stand?
9. Make a graph of the increase in number of teachers of kindergartens in ten of the leading cities.
10. What are the merits and demerits of the Montessori system?

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CHAPTER III

SPELLING

Preliminary Problems

1. How many words should elementary school children be taught to spell?
2. How should these words be graded?
3. How many words should be taught in one lesson?
4. What proportion of the time of each lesson period should be devoted to review work?
5. How frequently should the entire period be devoted to review work?
6. How far are we justified in teaching new words for the purpose of enriching the pupils' vocabularies?
7. What relation may exist between the number and length of the learning periods on the one hand, and the grade of the pupil on the other hand?
8. What bearing upon the content of spelling have the reading, speaking, and writing vocabularies of pupils?
9. What habits in relation to spelling is it desirable for pupils to develop?
10. What is it to "know how to spell"? When does a pupil need to know how to spell?

Two Lines of Development.—The pedagogy of spelling has taken, of recent years, two definite lines of development. The first concerns itself with the content or material taught; the second concerns itself with the learning process. In both instances, what writers have to say is being based on actual experimental investigation, rather than upon statements of opinion derived from philosophical postulates.

I. The Content of Spelling. Selection of Words

The content of spelling is the words to be studied. We are here concerned, primarily, with the selection of a fitting

material for teaching. We no longer hope, on the one hand, to teach children many thousands of words, including a great proportion of unusual ones, as has been in vogue where copious spelling-books have been in use, nor, on the other hand, are we any longer under the delusion that children's vocabularies are exceedingly meagre. Such statements, for instance, as that five or six hundred words are all that are necessary for carrying on the ordinary communications of life are now known to be grossly in error. Several experiments have been carried out, tending to establish the number of words in the vocabulary of children as being much higher than had been supposed.

Material of Spelling—Jones.—One of the earliest of these is by Doctor Jones, of the department of education, University of South Dakota [7]. The problem was to determine "what words, grade for grade, do children use in their own, free, written speech, and what words, therefore, do they need to know how to spell?" In making up his lists of words, Doctor Jones assigned the words to the lowest grade in which three per cent or more of the pupils used them in spontaneously written work. He gives his lists for each grade, finding the following as a summary of the number of words used:

2d grade	1,927	words
3d grade—new words added to 2d grade list	469	"
4th grade— " " " " previous lists	442	"
5th grade— " " " " " "	432	"
6th grade— " " " " " "	425	"
7th grade— " " " " " "	419	"
8th grade— " " " " " "	418	"
Total	4,532	words

Doctor Jones also finds that the number of words, per pupil, is, on the average, unusually high. He gives the folfowing table:

Grade 2	521	words
" 3	908	"
" 4	1,235	"
" 5	1,489	"
" 6	1,710	"
" 7	1,926	"
" 8	2,135	"

These figures represent words used by children "in their own free, written speech." They are, "therefore," the words that they "need to know how to spell." Undoubtedly this is true. There is danger, however, that in emphasizing the writing vocabularies of children as indicating what words they need to know how to spell, we lose sight of the fact that we should strive, also, to enrich their vocabularies—writing, speaking, and reading. The spelling lesson is certainly one of the agencies whereby useful words not yet known may be taught. Words not yet in the writing vocabulary, but in the larger speaking vocabulary or the still larger reading vocabulary, may be worked over into the writing vocabulary; and in this work the spelling lesson should play a part. If, therefore, the effect of the recent vocabulary studies is to limit teaching merely to those words which children already know well enough to use them in written discourse, the studies will have overshot their mark. Their legitimate effect should be to point out first essentials, but not to limit spelling material to them.

Vocabularies of Letters—Ayres.—The study of Doctor Ayres on the vocabularies of personal and business letters [1] throws further light on the proper materials for spelling. This vocabulary is made from letters written by adults. A comparison of it with a few pages from the ordinary spelling-book suggests a part of the reason why instruction in spelling is not more effective. Doctor Ayres found, for instance, that of the 414 words in the National Education Association lists, only 125 were found in the two thousand letters which he analyzed, no one of the remaining 289 appearing even once.

"This seems," he says, "to be good evidence that useful spelling lists cannot be compiled by sitting at the desk and deciding which words people ought to know how to spell. What we must know is, rather, which are the words that ordinary people need to know how to spell." Doctor Ayres publishes a list of 542 words which, with their repetitions, constitute seven-eighths of the 23,629 words tabulated. He gives the number of times each word appeared in the personal and business letters. He gives no words which occurred fewer than six times. I cannot help thinking that he would have added a very useful list of words if he had given us those that were used, say, from two to five times. Of course, some of these last would have been of relatively little use, but the greater part of them, if we may judge from the character of those that were used six times, would have been a valuable addition to his list. Doctor Ayres has also published a thousand-word list which we give on another page.

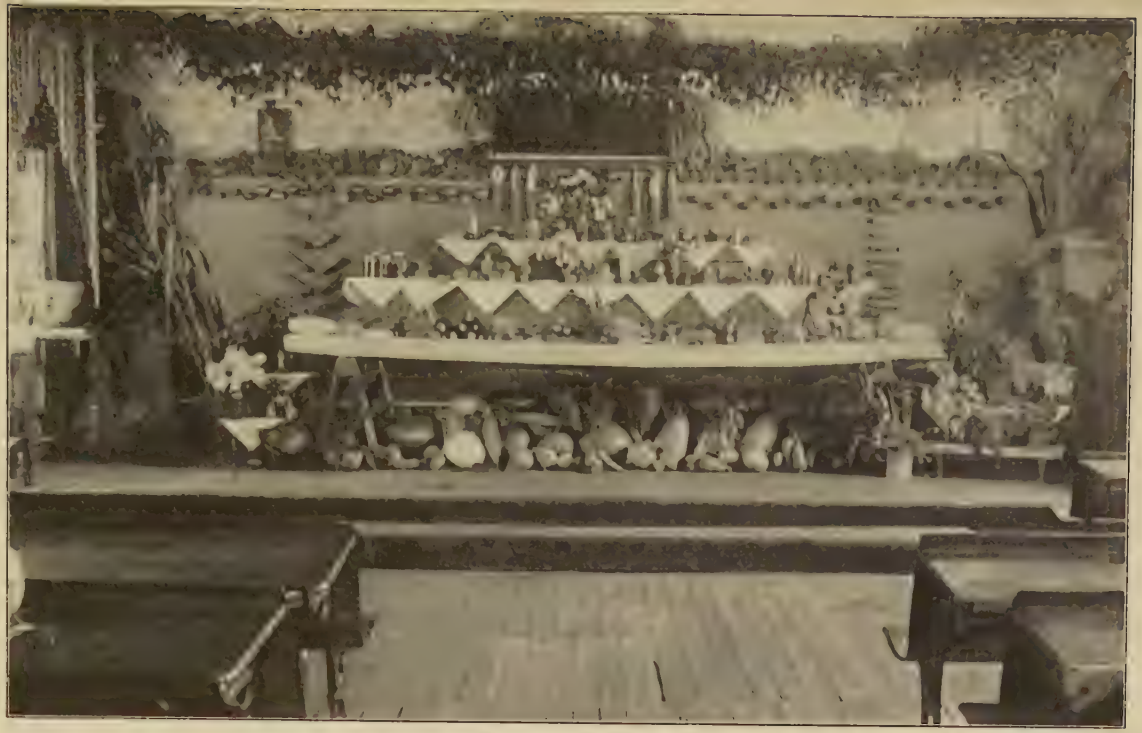
Other Vocabulary Studies.—Another vocabulary study was made by R. C. Eldridge, who examined two pages each of four different newspapers [6]. From this examination he found that 6,002 different words were used in an aggregate of 43,989 words. He publishes this list of different words, arranging them in the order of their frequency of occurrence. The method is similar to that of Doctor Ayres. It is, however, carried out upon different material, and affords a more extensive list, largely because every word is included, no matter how many times it occurred. Eldridge also gives a list of words compiled in 1904 by the Reverend J. Knowles of London [8]. This list appeared in a pamphlet entitled "The London Point System of Reading for the Blind." It consisted of 353 words, with the number of times each word occurred in "passages from the English Bible and from various authors containing 100,000 words."

Probably the most interesting study of the subject of spelling, both from the point of view of the lists of words proposed, and also from the point of view of the many ques-

tions upon which it throws light, is Cook & O'Shea's "The Child and His Spelling" [5]. The word lists are derived from the social and family correspondence of thirteen persons, differing in sex, age, education, and experience. There are four lists, the first consisting of 186 words, used by all the correspondents; the second consisting of 577 words, used by a majority of the correspondents; the third consisting of 2,207 words, used by more than one but less than a majority of the correspondents, and the fourth consisting of 2,230 words, used by but one of the correspondents. The first three of these lists are published. Data are given in connection with all these words, tending to show to what extent they are used in modern spelling-books, to what extent the words are peculiar to the vocabulary of men or of women, and whether they appeared in the lists of Ayres or of Chancellor [4].

In the three published lists of Cook & O'Shea there are 2,970 different words—a number which would be considerably increased if, as in the case of Eldridge's list, all inflections of forms were counted as separate words. Including the words used by but one of the correspondents, there were 5,200 different words that appeared at least once. This is exclusive of all proper names, foreign phrases, and inflected forms.

A number of other studies which have appeared upon the content of spelling might be mentioned. A pamphlet prepared by E. E. Lewis [9], for use in high schools, contains material derived from the lists of Jones, Eldridge, Ayres, and Cook & O'Shea, together with a selection from words commonly misspelled by high-school students. Another pamphlet, published as Bulletin No. 1 of the Boston Department of Educational Investigation and Measurement (Doctor Frank W. Ballou, director) contains "Provisional Minimum and Supplementary Lists of Spelling Words for Pupils in Grades I to VIII" [2]. A report by Nicholas Bauer, entitled "The Writing Vocabulary of Pupils of the New Orleans Public Schools" [3], is a compilation in graded lists of the

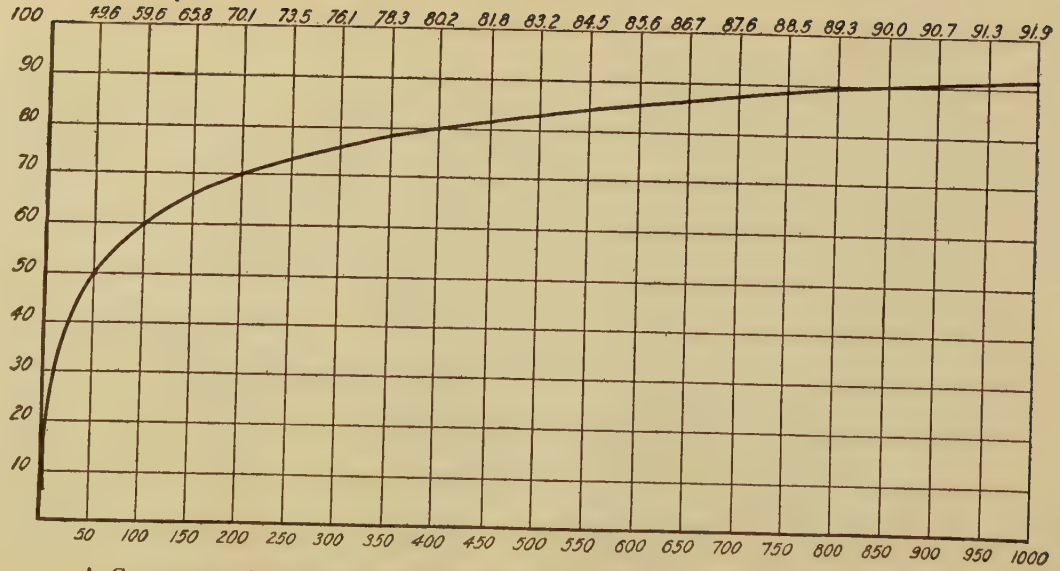


A boys' and girls' club exhibit in an old style rural school. Many spelling words needed in letter-writing here suggested

words found to have been used in the themes of approximately 18,000 children in the third to the eighth grades inclusive. Attempts to bring the modern idea as to the content of spelling into the covers of text-books have likewise been made by Studley & Ware, who have prepared a graded word list and teachers' manual for elementary schools, the list of words being selected from nine thousand compositions written by elementary school pupils [13]; and by Miss Anne Nicholson in "A Speller for the Use of the Teachers of California" [10]. Pryor's list is also very suggestive [11].

The Number of Words We Use.—These vocabulary studies show that we use a very few words a great many times. The word *the* is by far the most frequently used word in the language. On the average it occurs once in every sixteen words of written discourse. *And*, *of*, and *to* each occur about once in every thirty words, and *I* about once in every forty. These five words taken together constitute, on the average, from one-sixth to one-fifth of the number of running words in written discourse. Adding to them the next four words in the order of frequency, namely *a*, *in*, *that*, and *you*, we have 9 words which, with their repetitions, constitute one-quarter of all the words we write. The 50 commonest words constitute one-half, and the 278 commonest three-quarters of our written words.

It will be seen that the number of words included increases very rapidly for equal added proportions of total words written. The accompanying figure will make this still more evident. The data for this figure are taken from Ayres's "Measurement of Ability in Spelling" [14 : 12–20]. It was compiled from the original material of Knowles [8], Eldridge [6], Ayres [1], and Cook & O'Shea [5]. The horizontal scale is for numbers of words in the order of their frequency. The vertical scale is for the percentage of running words in written material represented by the number of words shown on the horizontal scale. From this figure it is seen that the 100 most frequently used words comprise 60 per cent of the words used



A Cumulative Curve for Word Frequencies in Written Discourse, Aggregating 100,000 Words

The horizontal scale is for numbers of words beginning with the most frequent. The vertical scale is for the per cent of the aggregate comprised by the most frequent words to the number indicated. Thus 50 words (bottom of graph) make up fifty per cent (left of graph) of our correspondence, 100 sixty per cent, 400 eighty per cent, etc.

in writing; that the 200 commonest words comprise 70 per cent; the 400, 80 per cent; the 850, 90 per cent; while the 1,000 commonest words comprise 92 per cent of written discourse.

We thus have in Doctor Ayres's compilation an important contribution to the content of our teaching of spelling. It is, as he calls it, "a foundation vocabulary," and no list of words for the use of elementary schools should fail to include it.

This does not mean, however, that there are not a great many frequently used words other than those in Doctor Ayres's list. The least common words in his list are, nevertheless, so necessary in the expression of our ideas that they suggest the existence of numerous other words only a little less useful than themselves, and quite indispensable in the written vocabulary of the majority of people. Instances of words not found in the list are: ankle, apple, ate, banana, base, basket, bath, battle, beans, beautiful, because, bird, bite, bottle, bread, breath, breathe, bright, broad, brown, bundle. These words are taken from a list prepared for elementary school use, and from which words presenting no important spelling difficulty had been excluded. Only words beginning with *a* or *b* were consulted. These words, any one will agree, stand for ideas which are common to every age and to every walk in life. I cite them, not as a criticism of Doctor Ayres's list, but as a caution against supposing that because his words constitute more than 90 per cent of the written words examined in a rather large amount of material, they are anything more than they pretend to be, namely "a foundation vocabulary."

Nor does this vocabulary mean that all the words in it should be presented as spelling material. There are many which offer no spelling difficulty. The few mistakes that children make in writing them are due to motor inco-ordinations, to "slips of the pen." The eradication of such errors is not specifically a spelling problem. The habit of looking at a word after it has been written is worth inculcating, al-

though it is possible that such a habit may interfere at times with free and vigorous composition. Doubtless it is true in spelling, as in every human endeavor, that a certain amount of imperfection must be expected. It is certain that to labor for higher results on words which children already habitually spell, say 97 to 100 per cent correct, is a waste of time and energy.

II. The Content of Spelling. The Difficulty of Words

The Analysis of Spelling Material.—Another way of approaching the matter of the content of spelling is to analyze the spelling papers which children write. It is probably true that not only in spelling, but also in all subjects of the elementary school curriculum, the constant pressure for higher efficiency and greater economy of time will make it necessary to analyze, critically, the material which we teach. I have attempted to do something in this way in a former study of spelling [15]. I have shown that the words of a given list tend to maintain the same order of difficulty in each grade, and that this tendency is also strongly in evidence as between schools in different localities. Consequently, it may be maintained that the difficulties which words have are more or less to be found in all grades and localities. I have shown, also, how words may be combined into groups of equal difficulty, and into groups differing in point of difficulty, by equal amounts. Not the least significant portion of this study is that in which the arrangement of fifty words, according to teachers' judgments of their spelling difficulty, is compared with the arrangement of the same words on the basis of actual testing. If it is found that the trustworthiness of the judgment of a single teacher is of almost no value at all; if it is found, for instance, that the one word which was incontestably the hardest of the list was, by more than one-fourth of the teachers, judged to be actually the easiest or next to the easiest; if the relation of individual judgments,

to the result of testing, show practically a zero correlation, then an important commentary is made upon why children spell so poorly. It may, for instance, be suggested that children do not spell certain words because their teachers do not know that they are hard to spell. It may be inferred that a more accurate knowledge of the *difficulty* of words and of the *usefulness* of words would enable the emphasis to be put in the right place. The studies which have to do with the difficulty and the usefulness of words are only a beginning and a prophecy of what may and should be done to make the content of spelling conform to the requirements of written discourse and to the economy of classroom instruction. Even now there is no good reason why a teacher should not be acquainted with the difficulty of a large number of words. In addition to the study which I made in 1913, a somewhat similar study was made by Doctor Ayres of the difficulty of each of the words comprising his "foundation vocabulary," to which I referred above. No adequate description or criticism of this admirable piece of work can be attempted within the limits of this chapter. The book and the spelling scale which accompanies it should be in the hands of every teacher of spelling. The list is presented herewith. The scale shows the marks by grades which children made who never had drilled on this particular list.

Need of a Uniform Material for Test Purposes.—The bearing which a study of the difficulty of words has upon the experimental investigation of problems in spelling ought to be indicated. The field of inquiry in this subject, as well as in other school subjects, has been restricted by the fact that we possess no material of equal difficulty by which the ability resultant from given methods or processes may be determined. Attempts have been made to decide between a drill method and an incidental method of teaching spelling. The results are conflicting and are likely to remain so as long as the material which forms the basis of testing the results of the rival methods continues to be of varying difficulty. It is

true that investigators have chosen groups of words which they judged to be of equal difficulty, but we have already seen how astonishingly unreliable their judgments are likely to be. Doctor Judd's survey of spelling in Cleveland schools has left the problem open.

Conflicting Evidence in Experimental Inquiry.—Experimental inquiry in regard to spelling is in somewhat the same condition that it was in regard to memory before Ebbinghaus invented his system of nonsense syllables and thereby gave the science of experimental psychology a material of substantially uniform difficulty. We may speculate as to a "best" method of teaching spelling, as to the proper length and number of periods of work, or as to the effect of training with specific lists on the general power to spell. We may even seek to decide these questions experimentally; and it is quite conceivable that by these processes of speculation and experimentation some knowledge will be gained. But a great deal of conflicting evidence will be obtained; and it is to be feared that, as in the past, our knowledge will be too often indefinite and inconclusive, unless we have at hand a sufficient body of material of known difficulty. The construction of such a body of material is at present the most important experimental work to be done in the field of spelling, as perhaps it is in other fields. Doubtless it is more attractive to attack problems of method, or of fatigue, or of the influence of ideational types; but the humbler task is the one that is immediately necessary.

III. The Method of Teaching Spelling. Presentation

Method and the Learning Process.—Meanwhile, however, we may properly turn our attention to what has been done toward establishing a method of teaching spelling. As stated at the beginning of this chapter, the tendency at present is to develop our methods of presentation with reference to the learning process itself. Our inquiry now is centering in the learner rather than in the teacher. In conformity with this

tendency we are seeking, in the first place, to know how a given material may best be observed, imprinted, and retained; and in the second place, what the rôle of the teacher should be with reference to these processes.

I do not propose to enter at any length into the details of teaching devices. Many of these have often been formulated. Sometimes they appeal to our judgment as worth while, and sometimes they do not. For most of them there has been no evidence presented which commands our respect.

Pronunciation, Meaning, and Spelling.—Obviously, however, the factors of pronunciation and of meaning are inseparably bound with the factor of spelling, and no correct method will neglect any one of the three [25 : 29 *ff.*].[1] Methods will differ, and doubtless should differ, in the way these factors are presented and the emphasis that is placed on each, according to the nature of the words to be taught, the character of the class, the time at the teacher's disposal, etc. Among good teachers, probably the most usual method of teaching meaning is by discussion and use of the word in natural contexts before the spelling is taught, supplemented later by a frequent use of the word and an encouragement of pupils to do the same.

Measures of Prevention.—The conscious attempt to prevent the first appearance of any misspellings is worth mentioning as a principle which is in full accordance with the psychology of habit [38 : 13]. It is hard to form correct reactions after wrong ones have been set up.

Initial Focalization.—Another principle which is derived from the law of habit formation is that the words should be strongly focalized when first presented. As to the manner of this focalization, the most frequent method is an appeal to as many senses as possible. "Combine the sight of the new word with the analytical copying of it, plus at least a whispered pronunciation of its constituent elements."—(Meumann.) The literature on this subject is rather copious, and especially so if we include certain memory studies

[1] Reference 25, page 29, at end of chapter.

which have been drawn upon to help decide the question. The entire subject is complicated by the learner's imagery type. If he is dominantly visual-minded, a visual presentation will facilitate the use of his preferred mode of learning. If his imagery is preferably of the auditory type, an oral presentation may prove to be the most effective single method. It is probably true, however, that, as Lay pointed out, vocalization and hand-motor processes are important aids for all types in learning the spelling of words [22 : 84]. For further evidence on this matter, the reader is referred to the summary and references given by Miss Abbott in her admirable study [16 : 128–134]. It is apparent that no one method of presentation is always best. The age of the pupil and the character of the words have much to do with this. For irregular and difficult words visual presentation is better than auditory presentation, irrespective of age. For familiar words, auditory presentation is the better for young children, while visual presentation is superior in the case of older children and adults. Accordingly, since the determination of types of imagery is difficult and impracticable in schools, a combination method, such as Meumann's, quoted above, is more reliable; although the emphasis upon one or the other elements may be shifted according to the age of the pupils and the difficulty of the words.

Importance of the Process of Recall.—There is an element in the learning process which it will be worth while consciously to develop. We have all noticed how general is the tendency in learning stanzas of poetry, to look away from the material, after a few readings, and to attempt to recall the material, referring to the printed words to correct errors or verify a tentative reproduction. This tendency of the learner is so strong that it must be an important part of the process. Witasek, experimenting with adults, found that six readings, combined with five attempted recitations, were more economical for learning than as many as twenty-one readings without any recitations; and his conclusions were

verified by Katzaroff. Miss Abbott, in her experiments on methods of presentation in spelling, reached similar conclusions. She presented one series by exposing each word for three seconds, allowing five seconds for recall before the next word was shown; in another series each word was shown for five seconds with three seconds for recall; and in a third series, seven seconds were allowed for exposure, and one second for recall. It was found that the method which allowed five seconds of the entire eight seconds for recall was the superior method, both as regarded immediate spelling and spelling after an interval of four days. "We may conclude," she says, "that it is of especial value to convert the perceptive process into terms of imagery, . . . of more value than if the time had been spent on repeating the perceptive process" [16 : 153].[1]

Time Allowance for Perception and Recall.—In practice it will be found that the time to be devoted to perception will vary with the difficulty of the word, being longer for the more difficult words. A uniform time is not desirable. It is best that the perception of a word and its recall should each be just long enough for the learner to complete the required process. A longer time in either case results in a decrease in attention and a deterioration in the result. In this connection, the use of perception cards, each containing a single word, will be found more effective than the writing of the words on the blackboard. The cards may be inserted in a frame after the first presentation of the word [20].

[1] See also a study by the same author, "On the Analysis of the Factor of Recall in the Learning Process," *Psych. Rev. Mon.* No. 44, pp. 159–177. In this study the conclusion is reached that, supposing the time devoted to learning a given material to be constant, the recall process is always an aid, that if it comes after the *Einprägung* (perceptive process) its value decreases as delay increases, and that it is of most value when interspersed with the *Einprägung*. It would seem, therefore, that the best method in spelling would not only include a presentation, calculated to induce a strong perception, but also one or more provisions for recall followed by a direct reference to the words for correction, verification, and strengthening of the impression.

IV. The Method of Teaching Spelling. Management

More important than the presentation is the management of the spelling material. By management I mean (*a*) the regulating of the periods of work, according to the time assigned to the subject, and (*b*) the arrangement for relearning or reviewing the material.

The Superiority of Short and Frequent Periods.—What evidence we possess tends strongly to show the superiority of short and frequent periods in the learning process. This is so generally true that it may be accepted as a rule for our guidance, although it is clear that the shortening of the period may be carried to the point of diminishing returns. A certain adjustment to the task in hand is necessary, both physically and mentally. Some time is lost in getting ready. Accordingly, if periods are made too short, a large percentage of time is lost. But, having decided how much time per week may be used for spelling work, it is well to make the learning periods short enough so that the attention of the pupils may be concentrated throughout. In ten of the leading American cities an average of 7.22 per cent of the time is spent on spelling as a subject [38]. If the week has 5 school days of 5 hours each, this would give 108 minutes a week. Probably six or seven 15-minute periods (that is, two periods on 1 or 2 days of the week) will prove more effective than the more conventional arrangement of 20 minutes daily. Drill periods may well be shorter than teaching (presentation) periods. A daily 5-minute period for rapid drill, in addition to a 15-minute period for general instruction, has been found to work well. Ten-minute recitation periods have also proved successful. It is a matter to be decided by the capacity of the pupils for sustained and intensive effort. With young children two 10-minute periods, or one 10-minute period and two 5-minute periods will give good results. Indeed, both with young and older children it is highly advantageous to take two or three minutes several times a day for rapid oral drill.

Setting a Time Limit.—It is frequently good practice to set a *time limit* within which the pupils are to see how much they can accomplish. For any kind of school work it makes a great deal of difference in securing the maximum of attention whether a teacher says "work on this for the rest of the period," or "see how much you can get done in five minutes."

The Need and the Effect of Relearning—Jost's Law.—The second factor in what I have called management concerns itself with the relearning or review of the words already learned. When material has once been learned only up to the point of a first errorless reproduction, there is no guarantee that permanent retention has been secured. In fact, in all but the most meaningful material, where the associative connections are very strong, it is generally true that the learner is quite unable to reproduce after an interval of a few days or weeks what he was easily able to reproduce immediately after presentation. But the first learning has left its trace. The material may be relearned in much less time and with more permanent effect than was true in the first instance. The law formulated by Jost[1] is operative in this connection, namely, that (1) "If two associations are of the same strength but of different age, a new repetition will have the greater value for the older one," and that (2) "If two associations are of equal strength but of different age, the older one will decrease the less with time." Translated into a concrete situation, this means that if the learner, or a class of learners, is equally capable of spelling two words, one of which was learned yesterday and the other to-day, equal effort spent in relearning each will tend more to the permanent acquisition of yesterday's word than to that of to-day's word. The correct procedure, therefore, seems to be to make the initial presentation of the new words of a lesson strong and to secure focal attention upon them up to the point of errorless spelling; but to go no further at that time. The additional minutes thus spent will not be so well employed as they

[1] Ueber das Gedächtniss, Leipzig, 1885.

would be, let us say, an hour later. This has bearing, from another point of view, upon what I have said about the value of short and frequent periods.

Systematic Reviews. The Cleveland Plan.—In a more formal way than by these brief "relearning" periods, provision should be made for systematic reviews. This is the chief reason for the success of the plan which has been carried out at Cleveland. The words taught yesterday are reviewed with those taught to-day. Those taken up as new words last week are reviewed in connection with those taken up this week. After eighty new words have been taught, they are reviewed a third time for a test to which added interest is given by the fact that all classes of the same grade are simultaneously tested throughout the school system on the same words and the results published. At the end of the year and prior to a final examination, the words, then amounting to 320, are for a fourth time reviewed; and they are used a fifth time the following year, being taken up as subsidiary words in connection with a new list. I have myself used this plan for four years, with such modifications as the New York City course of study makes necessary (it required 600 words a year above the third grade), and I can vouch for its efficacy.

Spelling in Context.—But all these reviews, while effective for the limited series in question, will be essentially artificial and unconnected with the real purpose of spelling instruction unless they are supplemented and supported by a material and a method of a more vital character. We may drill children in oral spelling; and we certainly deny ourselves a very valuable instrument if we do not. But in life outside of the schoolroom, our pupils will never have occasion, except as a *tour de force*, to spell orally. We may require our pupils to write words in columns; and we may sometimes be justified in doing so in order to save time. But again they will not use their spelling ability in such a fashion. We may, ourselves, select the words which our pupils are to learn, and our greater experience ought to enable us to do so with good

effect. But in the situations in which they will have to spell, it is the pupils themselves who will choose the words. No proper method, therefore, will neglect the spelling of words in context; and no test of our pupils' ability will fail to measure it in situations which approximate those of normal use. Moreover, we should get an important supplement to our standard list from the errors in spelling which they make in their own written work.

Individual Spelling Lists.—In doing this, I have found it to be an invaluable aid in the teaching of spelling to have each pupil keep an individual spelling-book. He may be given a small blank book, and be required to alphabetize it and to enter in its proper alphabetical place any words which he finds he has used but has not spelled correctly. The alphabetical arrangement facilitates reference and checks repetition. The individual spelling-books will need to be supervised carefully, and the pupil occasionally called upon to tell how many words he has gathered and to spell at least a random selection of them. By this means provision is made for his initiative; and, at least for these words, a real motive is supplied for learning to spell. There is an evident adjustment to individual needs—an adjustment more exact than is possible with any fixed list, however excellent.[1]

V. The Doctrine of Purpose

The significance of the learner's purpose or intention in the learning process has lately received attention from many quarters. For a long time we have been familiar with the doctrine of purpose. We have read many discussions regarding the aim of education; and it is conventional in books on special method to have much to say in the beginning about the purpose of the subject in question. It is expected also that each lesson plan prepared by teachers shall have its statement of aim. These formulations, when they are well

[1] The editor also tried this "little-dictionary" plan and found it good while a principal in Minneapolis.

made, have no small value; and it is by no means my intention to deprecate them. But they are too often centered in the teacher, and too seldom concern the pupil. The real value of a purpose is first evident *when it becomes the purpose of the child himself*. It is not necessary, and it would not often be wise, to try to induce him to realize a philosophical conception of the aim of education, but it is quite possible and highly desirable that in all the learning he does he should be actuated by purposes that are true and valid for the work in hand.

Evidence of the Effect of Purpose.—It has been conclusively shown by actual experiment that when the learner has a definite purpose in mind, the result is materially affected *in the direction of the purpose*. Meumann observes in this connection: "One of the most important results of our recent investigation of the process of learning is the discovery of the extraordinary influence which the different intentions or attitudes of the learner exert upon his whole memorial process and upon his memorial results" [28 : 303, English edition]. It is found that when the purpose of the learner is to secure a permanent retention of the material which he is learning, he adopts an attitude different from that which he assumes when his purpose is merely to acquire the material temporarily. There is a different distribution of the activities of imprinting and recall, and a different adjustment of attention. In consequence of this, his permanent retention, as tested after a long interval, is markedly better than is that of a person who merely learns the same material for immediate reproduction or for temporary retention.

What the Purpose Should Be in Learning to Spell.—There are many occasions when an immediate recall or a temporary retention is all that is desirable. But such is not the case in learning to spell. In this part of his school work, therefore, the first and most general condition is that the pupil shall have a definite purpose to learn the material permanently. In that event, the resulting influence of will and of attitude will, to a large degree, determine the nature

of the memory effect. Quite apart, therefore, from a technic of method or of drill, a great deal may be gained by setting up in the mind of the pupil the purpose and the will to retain permanently. It is proper to observe also that such retention is not conclusively shown by ability to spell a given series of words in a formal test, at however remote a period such a test may be given. The real test, and the one which the pupil will himself realize to be true and worthy, is the ability to spell the words in spontaneously written discourse.

The Importance of the Learner's Consciousness of His Own Improvement.—A part of the purpose in learning must concern itself not only with the end of the process, but also with its progress. The intention to improve and the will to do so condition the success of the learner. It has been found in the numerous attempts which have been made, under experimental conditions, to educate individuals in various acts of learning, that the greatest improvement resulted not from general guidance nor from admonition, nor from mere repetition, but from an attempt to influence the will. An appeal to the feelings, the arousal of a desire to improve, and the heightening of the feeling of responsibility were found to be productive of the greatest practice effect. This truth has been emphasized by Meumann, who particularly notes the investigations of Borst [28 : 128, English edition]. Improvement in skill (*e. g.*, in typewriting) has been shown to depend mainly upon the energy and intensity with which the idea of improvement is fixated, and with which practice is repeated under its influence.[1] The most important factor in developing this attitude has been found to be the learner's *consciousness of his own improvement.* On the other hand, practice without knowledge of results has been shown to be of no effect.[2] The controlling influence of a consciousness of improvement was lacking.

[1] Book, W. F. "Psychology of Skill."

[2] Judd, C. H. "Practice without Knowledge of Results," *Mon. Supp.* VII, 1905, pp. 185–198.

VI. The Need for Standards

The will to improve, however, cannot be a mere empty volition. It must be gauged by fixed standards—standards which have a definite objective meaning, and by reference to which the learner may note his own progress and compare his achievement with the achievement of others. Herein lies the chief value in the keeping and publishing of records. In spelling, the knowledge of what other children have done, *i. e.*, the standards that they have reached, will have the same effect that such knowledge has had in athletics. Not long ago the world's record in the 100-yard dash was ten and one-fifth seconds. Only a few men could equal this time, and none could surpass it. Now there are hundreds of men who do so. The effect of the setting up of such standards is to furnish a continuous and strong incentive to greater expertness; and such incentives, as have been pointed out, determine improvement.

The Application of Standards in Spelling.—It is, therefore, greatly to be desired that standards in spelling may be set up; and it may not be too much to hope that by means of them a general improvement in spelling ability may be brought about. We should know, and our pupils should know, how hard words and groups of words are in terms of the percentage of children who spell them correctly. We should know by how much, with any given material, one grade surpasses another lower grade. We should have an abundance of words of known difficulty, by means of which we may register progress in ability, so that any one may know what we mean. It is much more satisfactory to be able to say to a child or to a class: "You spelled as well as most boys in the sixth grade," or, "You did better than eight out of ten children of the fifth grade can do," or, "You spelled ten per cent better than you did three months ago," than it is to say "You did very well," or "pretty well," or "a little better than last month."

We have all observed how decisively superior is the work of an excellent teacher with a poor method to that of a poor teacher with a good method. Indeed, it is often quite disconcerting to find how unprofitable a much-lauded method may be in the hands of certain teachers. They may carry out to the minutest detail all the steps of the approved plan; and yet they may make dismal failures. It is probable, however, that a truer insight would in any given instance reveal the fact that the method called "poor" was, after all, the better one, because it satisfied the fundamentally necessary condition of supplying the learner with standards, purposes, and ideals that find bearing through the will to improve. But only a few of our teachers are gifted enough to supply these conditions from their own resources. For the rank and file of teachers we shall have to provide not only a technic for presentation and for drill, but also standards by which they and their pupils may gauge their work. A purpose to learn, and a consciousness of progress may ensue for both teacher and pupil; and since it is precisely in these respects that the gifted teacher most conspicuously takes rank above the mediocre teacher, it is possible that the provision of *definite, objective standards of work* may do more than any other one thing to raise the general level of teaching ability.

While, therefore, it seems to be true, as stated in the beginning, that the development of a method of procedure in spelling has lately gathered about two principal ideas (the content of the material to be learned, and the learning process itself), it is also true that neither idea can have its full effect except as it is supported by the other. The process of learning is of no avail unless carried out upon a material that is rationally selected on the basis of its usefulness and its difficulty; while the best material and the most expert knowledge of its difficulty will have little effect except as these become the possession of the pupil and give propulsive force to his purpose and his will to learn.

SUMMARY

1. A few words, making up a very large part of written and printed material, constitute a fundamental vocabulary.
2. In such a vocabulary, however, many of the words present no spelling difficulty, while many words not included in it are, nevertheless, so useful that they constitute a necessary part of the verbal equipment of most literate people.
3. One of the first requisites in teaching spelling is to know the difficulty of the words to be taught; and for this the judgment of individual teachers is exceedingly unreliable, unless it is based upon the success of children in their attempts to spell.
4. In the measurement of spelling ability an evaluated test material in the form of words of known difficulty is required. Such material is gradually appearing.
5. In the method of teaching spelling, both presentation and "management" should rest upon the activities of the learner rather than upon those of the teacher.
6. Initial focalization should be sharp and should involve a multiple sense appeal, with a shift of emphasis to the visual for older pupils and for especially difficult words, and to the auditory for young children; while both visual and auditory presentation should be reinforced by motor processes.
7. The process of recall, as distinct from that of perception, should be consciously provided for in the presentation, and the aim should be to devote to each process just sufficient time for its completion.
8. In the matter of "management," experimental evidence supports the superiority of short and frequent periods, especially for young children.
9. Pupils should be encouraged to keep individual spelling lists and they should be tested upon these lists at frequent intervals.
10. Since the learning process is affected by the purpose of the learner teachers should avoid allowing pupils to entertain the mere intention to retain temporarily. Not only permanent retention but ability to reproduce in spontaneously written discourse should be the purpose of the learner.
11. It is demonstrated that knowledge of progress is a strong incentive, and this fact should be utilized by the keeping of systematic records.
12. For this purpose and for evaluating the work of grades and schools the need of definite objective standards of work is evident.

PROJECTS IN APPLICATION

1. From ten pages of the speller you are using select (*a*) the words which, in your judgment, all the children will use; (*b*) those which none of them will use unless they become highly educated.
2. When children are writing should they be permitted to use the dictionary? Should they be required to do so?
3. Group a term's assignment of words according to similarities in spelling. Teach the words by groups and compare the results with results by your usual method. There is evidence (unpublished) in favor of grouping the words. See also Pryor [11 : 86].
4. Select from the 1,000 words of the Ayres [14] list those which, in your judgment, do not need to be taught.
5. What relation exists between easy words and frequently used words, according to Doctor Ayres's report? Do you think it may be possible to omit the teaching of many frequently used words, relying upon their repetition in use to "imprint" them permanently?
6. From Ayres's [14 : 43–50] alphabetical list select ten words and arrange them in what you think is the order of their difficulty. Compare with the order of difficulty according to the scale. Continue this exercise, increasing the number of words. Compare your reliability for short lists with your reliability for long lists.
7. What rules do you find helpful in your own spelling? The case for rules is not made out, according to the reports. May this not be due to a general defect in the way they are taught?
8. To what extent may matters of "Word Study" such as prefixes, suffixes and stems, synonyms, etc., be introduced to give "content" to the work of the spelling period? What other kinds of "content" should be introduced?
9. Secure a cross-ruled note-book, enter at the left of a double page the words of each written test you give. Along the top enter numbers for individual pupils. For each misspelling score under the pupil's number and opposite the word. After all scores are entered, the vertical totals will give the pupils' records and the horizontal totals the records for words. If these are kept over a series of terms, the teachers of the same grades co-operating, the material will be extremely valuable as a measure of the success of teaching, and as material for word analysis.
10. What dictionary is best for each pupil to have in his desk and learn to use by using? How can the "dictionary habit" be developed?

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CHAPTER IV

HANDWRITING

Preliminary Problems

1. Are you prepared to *show* your pupils how to write, or do you only *tell* them?
2. Is your penmanship period dreaded by teacher and pupils or is it a period happily anticipated?
3. (*a*) Do you find pupils more easily interested by class instruction or individual teaching?
   (*b*) What, in your estimation, is the proper proportion?
4. Are pupils more readily stimulated by the sense of acquired freedom of movement and power or the ability to draw correct letters?
5. Do you prepare the penmanship lesson as carefully as you prepare the assignment in history or arithmetic?
6. What proportion of "do" and "don't" should govern the penmanship teacher's instruction to pupils?
7. Do your pupils hand in as well executed work in English as in penmanship?
8. How nearly should this ideal be realized in every-day practice?
9. Have you learned to interpret the meaning of jerky, uncertain lines? Can you apply the proper remedy?
10. Are you motivating the work in penmanship to the extent that you do the other branches in the curriculum?

I. Place of Handwriting in the Curriculum

Too many teachers underestimate the place of penmanship in the curriculum and what it requires of them in terms of preparation, skill, and enthusiasm. It should be as carefully prepared and as successfully taught as any other subject: the goal to be attained should be as definite, and results should be as critically estimated as they are, for example, in arithmetic. To a teacher who is able to meet such requirements as these, penmanship becomes one of the most inter-

esting subjects she has to teach, for the fact that the results in it are tangible makes it easy to arouse the enthusiasm of children of all ages, and enthusiasm in both teacher and pupils is a prerequisite of success in any undertaking.

Teacher Must Be Well Prepared.—Satisfactory results can never be reached by merely compelling children to imitate the copy in a writing-book. To give a general adverse criticism of a child's writing is useless unless the underlying difficulty can be found and remedied, if need be, by the illustrative teaching of correct forms and how to obtain them. If a class is required to master certain forms and movements and to attain a measure of muscular control, simple justice demands that the teacher previously shall have reached in actual practice the standard she upholds.

Correlation and Habit.—There is no subject in the school curriculum which, if it has been properly taught, may be so effectively correlated with other subjects; and one of the very first principles to be grasped is the necessity of insisting on excellence in *all* written work, whether it be the main point under consideration, as in the penmanship period, or incidental to other subjects. If the effort to improve is confined to the short time devoted to penmanship itself, it is impossible to produce a class of good writers, for when slovenly written work in other subjects is accepted by a teacher, even the best writers grow careless. The *habit* of writing well is fully as important as the *ability* to do so. Legibility is an easily recognized necessity, but in addition to good form and freedom of line there must be a reasonable rate of speed, and the ability to maintain both form and speed for a reasonable length of time. In brief, the writing lesson must be entirely practical, and no better test of its practicality can be devised than this application of it to all subjects which find their expression through the written rather than the oral word.

The Teaching of Beginners.—With first-grade pupils the teaching of penmanship is largely a matter of physical training, because the chief difficulty in the way of the child is his

An upper-grade classroom in Brookline, Mass., public schools. With shades pulling from the top of the window, there is always danger of too little light for writing and reading

lack of power to control and co-ordinate his muscles.[1] While form, freedom, and control must all be taught at the same time, in the primary grades greater emphasis should be placed upon correct position and pen-holding, with freedom of movement, than upon excellence of letter formation; although the teacher should not be too insistent upon a uniform standard of position. Children are no more alike physically than they are mentally, and within well-defined limits each child should be allowed to discover for himself the natural position of his body and the easiest way of holding his pencil. Good letter formation must not be expected until the pupil has acquired muscular control, and control comes only with long and patient practice. The primary teacher should not be too critical of the children's efforts, and should never criticise without encouraging and showing the way out of the difficulty.

II. Outline by Grades

1B Grade.—The first step in the work with beginners is to teach them to follow directions, and to gain free use of the arm. This may be accomplished most easily by use of the blackboard.

1. Divide the board into spaces, using lines which have the slant you wish the pupils to acquire.

2. Place in each space an ellipse, the long diameter of which measures three or four inches.

3. Have pupils stand about a foot from the blackboard, facing it squarely.

4. Let them begin at the top of the ellipse and trace it to the teacher's count: 1, 2, 3, 4, etc., using the direct move-

[1] See Freeman, "The Psychology of the Common Branches," chap. II.

ment, that is, the direction in which O is made. This is the time to begin insisting that they keep with the count. Movement exercises are useless unless they result in the freedom and control necessary for following the count. The crayon in use should be short enough to allow one end to rest in the palm of the hand.

Another similar scheme for beginners has been worked out successfully, as follows: The teacher places upon the blackboard ten horizontal lines, three inches apart, which are to be used for illustrating written work and for exercises. Each child is allowed twenty-two inches, measured horizontally, of the three-inch spacing, placed at a height within his reach. The following diagram illustrates the development of the scheme:

This device is to get the forward slant. No. 1 shows how the ellipse is started. No. 2 is developed from No. 1. No. 3 is made without letting the hand stop. Count 1, 2, 3—4, 5, 6—7, 8, 9; then tap three times with the arm moving continuously, and then begin to count 1, 2, 3, etc. The children, at the count 1, touch the board, and at the beginning of No. 3 lift the crayon, but do not cease moving the arm.

5. A little later the push-pull exercises may be used in the same manner.

6. Finally, practise the compact ellipse, imitating the copy set.

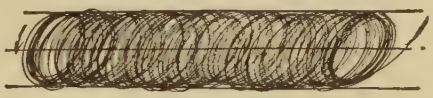
7. When the pupils have become fairly proficient in the exercises, let them trace, and then write, easy words, such as *on*, *one*, *none*, etc.

In this work, be sure that each pupil begins in the right place and moves in the right direction around each letter. Remember that exact form is not expected at this stage.

8. After pupils have gained some proficiency in blackboard writing, plain paper, and large, soft lead-pencils may be given them, and the same method of teaching followed as at the blackboard.

9. The child should learn to write his name and small words early in the year.

10. Position and pencil-holding must be taught. Pupils should sit with their feet flat on the floor, backs straight, heads up, and both arms resting easily on the desk and bent at nearly right angles. The left hand should hold the paper.



The proper position for the pencil is between the right thumb and forefinger, crossing the second finger on the inside about opposite the first joint. The thumb-joint should be bent outward with the tip of the thumb (not the ball) resting on the pencil. The end of the forefinger should be about an inch from the point of the pencil. All fingers should be held closely together and the hand well closed. The hand may be turned a little to the side in finger writing, but not very much.

Talk about keeping the thumb shorter than the forefinger, rather than about keeping the forefinger straight, and suggest that the end of the thumb be kept as close to the paper as possible. The pencil should cross the hand near the knuckle-joint, as this gives a good angle and helps prevent gripping.

All writing during this half-year should be very large (an inch, or more, for the height of minimum letters). Large writing will be done by the large muscles of the arm rather than by the less developed finger-muscles, without any particular direction from the teacher.

1A Grade.—Continue blackboard work. Require large writing, and still allow pencils to be held quite vertically, as

this assists in overcoming gripping. The wrist should be slightly raised from the desk, which should be touched only by the elbow and the third and fourth fingers. Use the compact ellipse, and have it made lightly and rather rapidly. Write longer and more difficult words.

The paper in use should be ruled in five-eighths-inch spacing, so that minimum letters may be made one space high, and others two spaces. This will make the writing even and teach the relative height of letters. Pupils should first trace a copy set by the teacher, then copy it below while the teacher names the letters, as: n-o-o-n. This device will keep the class together and result in their writing at the proper speed.

2B Grade.—Reduce the size of the writing a little by using paper ruled in three-eighths-inch spacing, instead of five-eighths-inch, as in 1A, but still make minimum letters one space high, and tall letters and capitals two spaces high. Do more work on paper in this grade, and less on the blackboard. Ordinary lead-pencils may now be given pupils.

Begin teaching the small letters by count to get a more exact form. There are many good ways to count for the different letters, but in this grade the directions given should be as definite and detailed as possible, impressing the children's minds with exactly what is to be done. In teaching *i*, for instance, the count may be—"up curve, down straight, up curve, dot." For *u*, "up curve, down straight, up curve," etc. To make this exercise of any value, the class must keep with the count. Rhythm helps. Never let the writing drag. Make words from the letters taught, and have pupils write them as you name the letters. Watch position and pencil-holding. Make sentences, using words you have taught, and letting the pupils write as you name the words.

2A Grade.—Continue as in 2B, making only one change. Use paper ruled in five-eighths-inch spacing, and make the minimum letters half a space high, and others a whole space high, excepting *t*, *d*, and *p*, which are a little shorter. Board work and seat work may be alternated by days.

Some of the recent models of movable school desk-chairs which are rapidly replacing the screwed-to-the-floor varieties

3B Grade.—Introduce ink and pens. Reduce the size of the writing a trifle by using paper ruled in three-eighths-inch spacing instead of five-eighths-inch, as in 2A. See to it that the children's writing is not too slow, too small, nor too heavy. Arm-movement work is not emphasized in this grade because the position exacted creates arm movement unconsciously, and if the teacher's work has been well done in the previous grades, many third-grade pupils will use it naturally. Review the small letters by count, and begin teaching the capitals, using the proper count for each one.

3A Grade.—Complete the teaching of capitals and take up words and sentences. Use the same methods as in Grade 2. Give much attention to position and pen-holding. It should be nearly perfect in this grade. In adjusting the penholder, the palm of the hand should be held directly over the paper, and the fingers should be turned under to give a good position for easy writing. The size of the writing should be one-third of a space for minimum letters, and not quite a space for the tall ones. By the end of this year's work the pupil should have acquired good form, correct position and pen-holding, and fair control and freedom.

4B Grade.—At this point emphasize movement exercises. In all movement writing, the arm should rest upon the thick muscles just below the elbow, and the hand should move on the nails of the third and fourth fingers. The hand should be held squarely palm down, and the wrist must not touch the desk. In this position the penholder, which is held just as the pencil position is described in 1B, will point toward the right shoulder.

In beginning movement work, have the pupils take a good sitting position with both arms resting equally on the desk (as described above) and bent at nearly right angles. Ask them to close their right hands. Now the arm rests on the muscles of the forearm, and the hand and wrist are free from the desk. In this position, have the pupils make the arm go in and out of the sleeve rapidly, at the rate of about 160

counts per minute. Count 1, 2, 3; 1, 2, 3; or, better, use a Victrola if one is at hand. Use a light, rhythmic tone in counting. Rhythm is of very great importance, as Freeman finds in his studies.[1] The speed should be 3 counts per second, 15 counts in 5 seconds. Use a watch until this speed has become habitual. It is important that all muscles be relaxed while doing movement writing. The movements for the retraced ellipse, both direct and indirect, should be practised in the same manner. When the exercises have been done properly, words may be taught. The following is an easy way to pass from exercises to words:

Use the Victrola or the rhythmic count. Keep to a speed of 160 down strokes per minute, since smooth lines cannot be obtained at too slow speed, and good form cannot be maintained at too great speed.

4A Grade.—Continue the compact ellipse and the push-pull exercises. To form a free swing for word and sentence writing, the small *e* may be used in the form of an exercise, as follows:

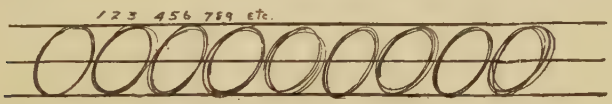
The speed of the gliding "e" exercise should be the same as for the ellipse. When pupils can write words of minimum letters, introduce words having one tall letter, such as "lame," and, later, words having more than one tall letter. The letters may be named, as l-a-m-e, as the children write, but they should be named fast enough to get the rate of at least 160 counts per minute.

During the last two months of this year, require pupils to write their spelling words with the arm movement. Although in the spelling lesson the letters cannot be named, the teacher may count 1, 2, 3, etc. (a letter being made on

[1] "The Teaching of Handwriting."

each count), if necessary to keep up speed. Do not drag. Correct position and movement are of more importance in this grade than exact form. If any pupils wish to do all their written work with the arm movement, they should not be discouraged.

5th Grade.—Require occasional board work here, as in all grades. The application of movement writing to all school work should be begun in this grade. It is impracticable before this because of lack of physical development and necessary control, especially in the case of the boys. The free glide and movement is developed very rapid'y from this point. The same exercises are used here as in Grade 4,



with the addition of the two-space retraced direct oval. The pen should begin moving before making the form, starting the path for the exercise, then touching the paper and retracing until the count 9 is reached, when it is lifted and kept moving until the count is begun and the previous exercise repeated.

6th, 7th, and 8th Grades.—Continue the exercises on paper —especially the direct compact ellipse, two spaces high— and have occasional board work. Review all capitals and small letters to get exact forms. Use the same methods as in the lower grades and drill on words and sentences from a copy. Use dictation freely.

Drill on figures should be used in all grades. Remember that the speed must not change. Too low a speed spoils freedom and ease of movement, and too high a speed spoils form. Insist in these grades upon the things emphasized during all previous years, good position of the body, of feet, and of paper, proper pen-holding and arm movement. The essentials, like the speed, do not change.

III. Standard Tests

Function.—The teacher must keep clearly in mind the function of the standard test, such as the Ayres quality scale and the Freeman speed scale. It should be used solely as a measure of the increase in *power* of the class and the individual, not as an arbitrary standard imposing mechanical methods of teaching. Properly applied, it reveals the strong points as well as the weaknesses in existing methods, and furnishes a stimulus to both class and teacher which in itself makes for increased efficiency.

Use of Standard Tests.—Under existing circumstances the standard test for penmanship should be used for but two purposes: first, to make plain the actual conditions in the classroom; second, to show whether the methods in use are producing a steady improvement or whether time is being wasted. Efficiency is possible only when the teacher knows these two factors so clearly that she is able to make definite demands upon her pupils.

Improvement in the penmanship of a class depends entirely on the pupils themselves, but progress is certain when the daily practice has back of it a clear-cut resolve to improve the quality of the writing of the previous day, and the knowledge of how to do it. Aimless drill produces little or no improvement. It may tend to actual deterioration, because a bad habit may become firmly fixed.

During the past few years standard measurements have been developed in several subjects of the elementary school curriculum, but none is easier of application than that for penmanship. In measuring the quality of writing by the standard scale, little opportunity is afforded for individual opinion. The question is simply one of putting a specimen of penmanship beside the one most like it in the scale employed.

Standard Scales.—Of the standard scales which have been published, that of Doctor E. L. Thorndike in the *Teach-*

ers College Record, of March, 1910, and the monograph, "A Scale for Measuring the Quality of Handwriting of School

STANDARD SCORE CARD FOR THE MEASUREMENT OF HANDWRITING
PREPARED BY PROFESSOR C. T. GRAY, UNIVERSITY OF TEXAS

Sample	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Heaviness 3															
2. Slant 5															
Uniformity Mixed															
3. Size 7															
Uniformity Too large Too small															
4. Alignment 8															
5. Spacing of lines 9															
Uniformity Too close Too far apart															
6. Spacing of words 11															
Uniformity Too close Too far apart															
7. Spacing of letters 18															
Uniformity Too close Too far apart															
8. Neatness 13															
Blotches Carelessness															
9. Formation of letters (26)															
General form 8															
Smoothness 6															
Letters not closed 5															
Parts omitted 5															
Parts added 2															
TOTAL SCORE															

(See bulletin on handwriting, Univ. of Texas, Austin, Texas.)

Children," by Doctor Leonard P. Ayres, of the Russell Sage Foundation, are the most noteworthy. They differ slightly in the methods by which the different specimens were selected,

but in both cases they represent the consensus of a large number of individual judgments. Each is made up of twenty specimens of penmanship, graded from 20 to 100. Theoretically these are separated by equal intervals, *i. e.*, the variation in quality between 20 and 30 is exactly the same as the variation between 80 and 90, or between any other two specimens of the scale. Herein lies one of the advantages of grading papers by such a method rather than according to the judgment of the teacher. When a teacher marks a set of papers in per cents, the difference in quality between 40 and 50 per cent is almost never the same as the variation between 90 and 100 per cent. In the case of the scale the standard is fixed: with per cents it constantly varies. Be sure to get the latest revised edition.

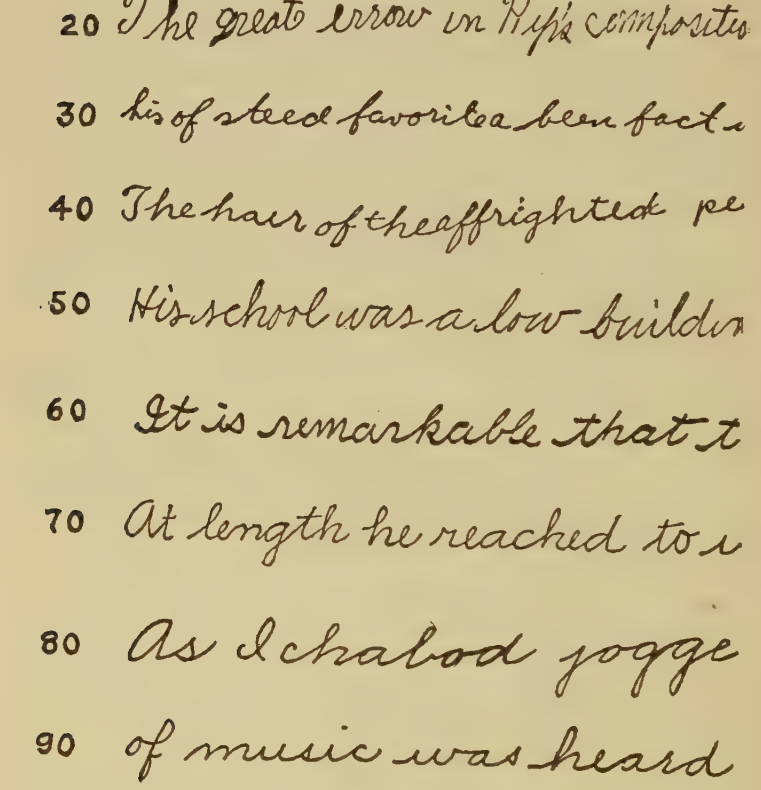
What Scale to Use.—In the judgment of the writer, neither of the two published quality scales is practicable for general use. The variation in the style of writing in different communities is sufficient to make comparison with them a slow and tedious process. They are, however, invaluable to a teacher who wishes to develop a scale of her own, made up of specimens of the style of writing used by her class.

For such a purpose, hundreds of papers representing the best writing of the pupils should be collected. Comparing them individually with one of these two standard scales divides them roughly into groups, each group being made up of all the papers which resemble the same specimen in the scale. The next step is to compare the papers of each group with its corresponding specimen, eliminating one after another until only the paper most like the type is left. Repeated with group after group, this finally gives specimens separated by approximately equal intervals and exactly corresponding in number to the steps of the first scale, but with the advantage of being in the style of writing used by the class, since it has been made up from their own work. If the final selection is approved by two or three examiners, the resulting scale will be even more accurate.

How Used.—The selected specimens should be fastened on a large sheet of paper or cardboard, or spread out on a desk in the order of their merit. The paper to be rated is then moved along the scale until it rests beside the specimen it most resembles, when it is given the corresponding mark. This is the rating of the individual pupil. The average of such ratings will represent the standing of the class. The median is more exact than the average, but the method of obtaining it is a little more complicated. As the name indicates, it is the paper so selected that the number of papers which surpass it in quality equals the number of papers of poorer quality. In rating papers in this way there is but one important factor, constancy of judgment, and it is reasonably certain that this will be attained if the ratings at successive times are made by the same person. Since the important consideration is that the class shall *improve*, rather than that it shall reach some arbitrary rank, it makes no essential difference whether the judge is severe or lenient. *Degree* of improvement is measured equally whether a severe judge gives the initial and final ratings as 10–13, or a more lenient one as 12–15. The only variation will be in the absolute standard reached.

The writer is fully convinced that if pupils are given access to the standard scale they will rate their own papers with a degree of accuracy sufficient for all practical purposes. If a pupil judges himself leniently both at the initial and final comparison and makes an improvement represented by an interval of the scale, he is no better off than the pupil who judges himself severely and makes the same degree of improvement, since the goal is gain in *power*, not the attainment of a fixed rank. As a matter of actual experience two, or even three, judges are in practical harmony so far as class averages are concerned. The reason for this agreement is evident. The majority of the papers plainly fall into their proper position on the scale: the only difficulty occurs with those coming on the border-line. By the law of probabilities, if a judge throws

one of these border-line papers into the lower group, he is likely to place another border-line paper in the higher group. This brings his average into exact agreement with the second


20 The great error in Rip's composite
30 his of steed favorite a been fact
40 The hair of the affrighted pe
50 His school was a low builde
60 It is remarkable that t
70 At length he reached to
80 As Ichabod jogge
90 of music was heard

SAMPLES OF CHILDREN'S HANDWRITING RATED AS QUALITIES 20 TO 90 BY MEASURING SCALE

judge, who perhaps reverses the distribution. It is not a matter of theory: the facts prove beyond dispute that the averages are reasonably constant.

What Quality to Expect.—In Doctor Ayres's original scale 18,000 specimens were employed, taken from grades

5 to 8 in forty different cities. The average quality was found to be 50 per cent. In his survey of Springfield, Ill., with 2,359 papers from the same grades, rated by different judges from those employed in developing the original scale, the average quality was found to be 49.3 per cent. This is indicated by the specimen marked 50 in the series of graded specimens on preceding page, reproduced by permission from Doctor Ayres's report of the Springfield survey.

That quality 50 represents approximately the initial standard of writing which may be expected from grammar school children finds striking corroboration from the writer's own experience in Elmira, N. Y. In that city 2,486 specimens of writing were collected and rated in the office of the superintendent. The average quality of these papers was 60. The variation between this figure and that given by Doctor Ayres is due to the fact that a scale for measuring handwriting had been used in Elmira for two years, and had radically improved the quality of the penmanship. This difference furnishes the best argument for the value of a standard scale to any school system.

IV. Results of the Standard Tests

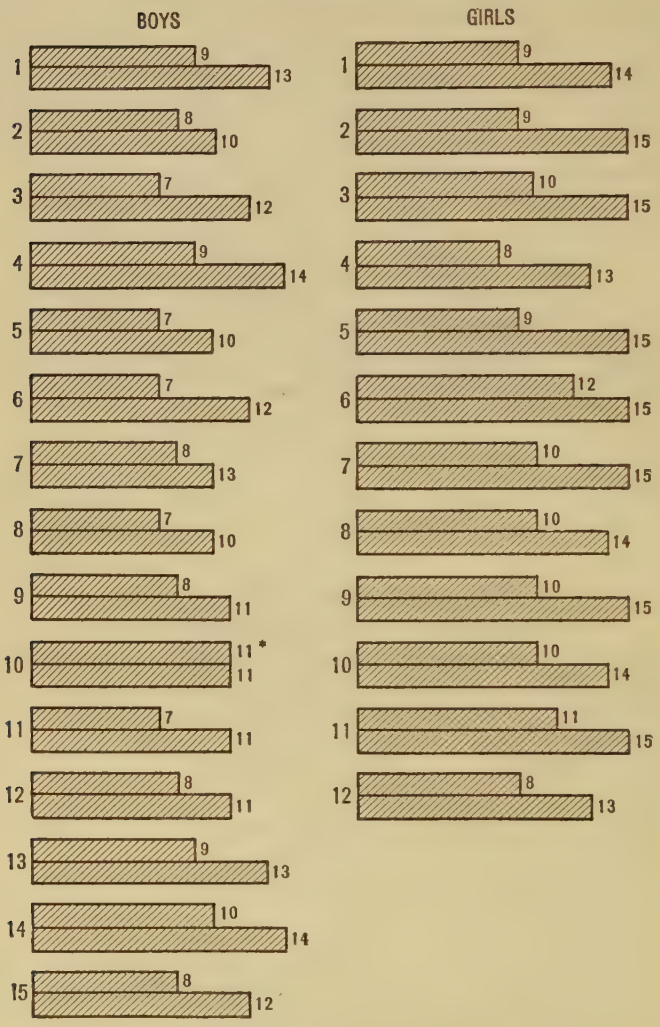
REASONABLE HANDWRITING STANDARDS

....Grades.....	1	2	3	4	5	6	7	8
Speed[1].....	20	31	38	47	57	65	75	83
Quality[2].....	6.5	7.5	8.2	8.7	9.3	9.8	10.4	10.9
Quality[3].....		27	33	37	43	53	57	65

[1]Letters written per minute. [2]Quality as measured by the Thorndike scale.
[3]Quality as measured by the Ayres scale.
Doctor Starch, in his book on "Educational Measurements"—gives a slide-rule device for getting a combined mark for both speed and quality.

Any method must be judged by its results. If the use of the standard test in penmanship will produce a radical improvement in the quality of the writing of school children, it is worth while. Its effect on a normal seventh grade appears in the following chart:

IMPROVEMENTS IN QUALITY OF HANDWRITING
MADE BY A SEVENTH GRADE CLASS
FROM OCTOBER TO JUNE



* This boy showed no improvement.

The figures at the left represent the numbering of the boys and girls in the class. At the right, the upper figure indicates the quality of each pupil's writing in September, while the lower figure shows the same fact for the following May. In the scale employed, the standard specimens were graded from 1 to 20, so the figures as given on the chart should be multiplied by 5 if they are to be reduced to the same basis as that employed in the scale by Doctor Ayres.

That a similar improvement may be expected for the entire school system is indicated by the following table giving a comparison of the quality of writing of the grammar school grades in September with that found in the following June:

CITY	GRADES							
	V		VI		VII		VIII	
	Sept.	June	Sept.	June	Sept.	June	Sept.	June
Elmira, N. Y.....	9	13	12	13	11	14	12	14
Montclair, N. J.....	8.7	12.2	9.4	13.1	9.5	13	9.9	14

These experiences with the standard test in penmanship have convinced the writer that it affords an instrument so simple and effective that every teacher not only may, but ought to, know definitely the quality and progress of the work being accomplished by her own pupils.[1] Freeman's proposed standards of achievement for the various grades in quality according to the Ayres scale and in speed according to the letters written a minute are given on page 99. The children are asked to write some simple sentence such as "Mary had a little lamb" for exactly three minutes. The number of letters per minute and the quality can then both be ascertained for each sample.

[1] The Ayres scale may be obtained for five cents from the Sage Foundation, New York City, or the Thorndike scale from Teachers College, Columbia, in the same city, at the same price. Doctor Ayres has also prepared a scale for measuring adult handwriting.

SCALE A

A SCALE FOR HANDWRITING OF CHILDREN IN GRADES 5 TO 8[1]

The unit of the scale equals approximately one tenth of the difference between the best and worst of the formal writings of 1000 children in grades 5–8. The differences 16–15, 15–14, 14–13, etc., represent equal fractions of the combined mental scale of merit of from 23 to 55 competent judges.

Quality 18. Sample 125

showed that the rise and fall of the tides
the attraction of the moon and sun upon

Quality 17. Sample 141

Then the carelessly dressed gentleman
stepped lightly into Warrens carriage and
held out a small card, John vanished be

Quality 16. Samples 32 and 84

Then the carelessly dressed gentle-
man stepped lightly into Warrens
carriage and held out a small

gentlemen stepped lighty into
Warren's carriage and held out
a small card. John vanished

Quality 15. Samples 49 and 89

lightly into Warren's carriage and held out a
small card. John vanished behind the bushes
and the carriage moved along down the drive

held out a small card. John vanished behind
the bushes and the carriage moved along
down the driveway The audience of passers

[1] These samples are reduced one half from the Thorndike scale.

Quality 15. (Continued.) Samples 47 and 90

John vanished behind the bushes
and the carriage moved along
down the driveway. The audience

Then the carelessly dressed gentle-
man stepped lightly into Warrens
carriage and held out a small white

Quality 14. Samples 54 and 19

Then the carelessly dressed gentleman
stepped lightly into Warrens carriage
and held out a small card, J

Then the carelessly dressed gentleman
stepped lightly into Warrens carriage and
held out a small card, John vanished behind

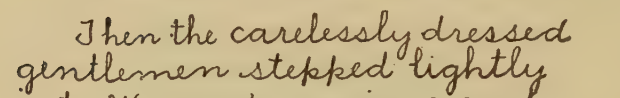
Quality 13. Samples 55, 24, and 26

Then the carelessly dressed gentleman stepped
lightly into Warren's carriage and held out a

vished behind the bushes and the car-
riage moved along down the driveway.
The audience of passers-by which had

Then the carelessly dressed gentleman
stepped lightly into Warren's carrige and

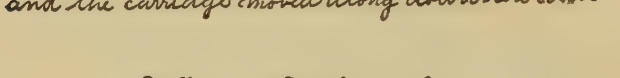
Quality 13. (Continued.) Sample 4

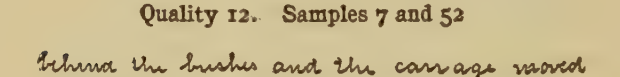


Quality 12. Sample 30

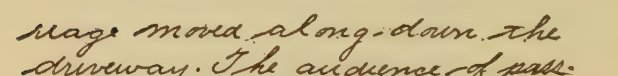
lightly into Warren's carriage and held out a
small card, John vanished behind the bushes
and the carriage moved along down the drive

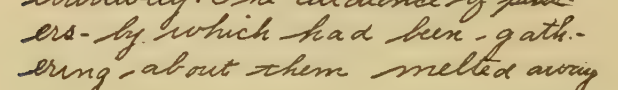
Quality 12. Samples 7 and 52



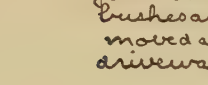

Then the carelessly dressed gentlemen stepped
lightly into Warren's carriage and held out a small
card, John vanished behind the bushes and the

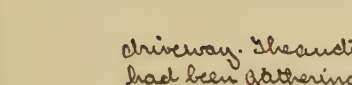
Quality 11. Samples 23 and 45



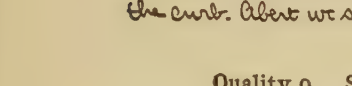


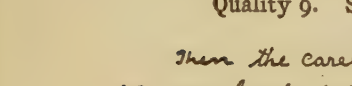
Quality 11. (Continued.) Sample 106

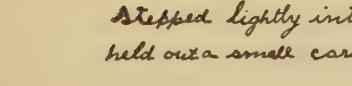

John vanished behind the
bushes and the carriage
moved along down the
driveway. The audience


driveway. The audience of passers-by, which
had been gathering about them melted away
in an instant leaving only a poor old lady on
the curb. Albert was sadly striching

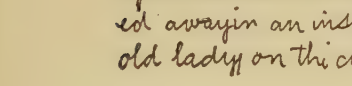
Quality 9. Samples 31, 21, and 28

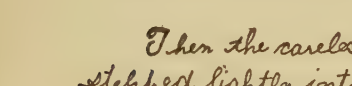

Then the carelessly dressed gentleman
stepped lightly into Warren's carriage and
held out a small card, John vanished behind the


bushes which had been gathering about them melt-
ed away in an instant leaving only a poor
old lady on the curb. Albert was sadly

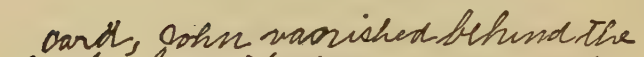

Then the carelessly dressed gentleman
stepped lightly into Warren's carriage moved
and held out a small card, John vanished

Quality 8. Samples 14 and 48

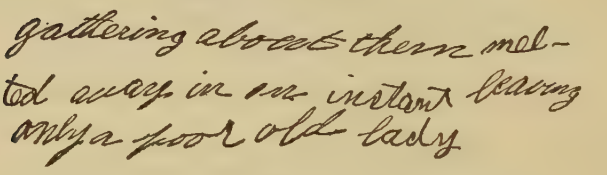

moved along down the driveway. The
audience of passers-by which had
been
gathering about them melted away.


Then the carelessly gentleman step-
ped lightly into Warrens carriage and
held out a small card, John vanished be-
hind the bushes and the carriage moved

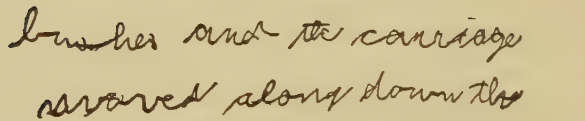
Quality 7. Sample 126



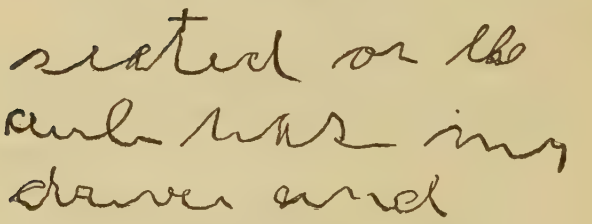
Quality 6. Sample 12



Quality 5. Sample 6



Quality 4. Sample 121



V. What System to Use

At the present time there is no conclusive evidence as to what constitutes the one best style of writing. At times the controversy among the advocates of vertical penmanship and those who favored the extreme slant, or the medium slant, has waxed warm. All are agreed that a good system of penmanship must be legible and must enable the writer to execute it at a reasonable speed and without undue fatigue. Which system will secure these desirable results is a disputed question. The study made by Doctor Ayres throws some light on this question, but he would be one of the first to declare that further investigation is needed before it is safe to accept his conclusions as final. He found but little difference in the speed actually developed by pupils in using the different systems of penmanship. His results are reproduced in the following table:

System Tested.	No. samples	Av. No. words written in ten minutes
Vertical	255	115.3
Medium slant	670	114.6
Extreme slant	580	116.1
Mixed	46	109.3
Backhand	27	101.0
Totals	1,578	111.3

It is probable that the pronounced opposition of the business world will prevent vertical penmanship from ever being taught in the public schools. The writer's conviction is that the semi-slant represents the style of penmanship most satisfactory for use in the schools when everything is taken into consideration.

VI. Motivation

While the standard scale furnishes incidental motivation, there are many attractive combinations of the push-pull ex-

ercises and spirals which arouse the children's interest, and should be introduced as soon as a reasonable degree of freedom has been attained. The pupils should be allowed to exercise their own creative ability after a good example of possible combinations suited to their power has been presented to them. The use of colored inks results in realistic butterflies, flowers, fans, quaint costumes, turkeys, log cabins, and automobiles, and gives the children delightful practice instead of tiresome tasks.[1]

SUMMARY

1. Good handwriting should be a habit, not an attainment.
2. The teacher should be able to illustrate concretely the skill she wishes to secure from the pupils.
3. Let first-grade teaching be largely a matter of physical training.
4. Beginners should work entirely at the blackboard until some degree of freedom and muscular control has been secured.
5. Below the fifth grade correct position and movement are of more importance than correct form.
6. Correlation should begin with the fifth grade if the proper foundation has been laid in the lower grades.
7. The standard test applied to penmanship furnishes a powerful incentive to teacher and pupils.
8. A home-made scale based on the Ayres scale is the most practical for average classroom use. The Freeman standards of speed may be used with it.
9. Pupils reaching a certain standard on their written school work should not be required to continue penmanship as a regular class exercise.
10. Motivate wherever possible for the great amount of practice necessary to secure *freedom* with legibility and reasonable speed.

PROJECTS IN APPLICATION

The problems presented in the teaching of handwriting naturally group themselves about the relation between speed and legibility and the best methods of securing power and freedom. Interesting investigation may be made by the teacher of the following topics:

[1] See Wilson's "Motivation of School Work," chap. X.

1. Whether a pupil who writes slowly is apt to be a superior writer.
2. Is a rapid writer more likely to be a poor writer?
3. If in teaching penmanship emphasis is laid upon speed, is it apt to be at the expense of form?
4. Does emphasis upon form mean a sacrifice of speed?
5. The effect of rhythm upon both speed and form may be studied by taking samples of children's writing and the amount written within a given time, before and after several months' training, using Victrola or rhythmic counting.
6. The relative fatigue resulting from rapid and slow writing which would determine where the most emphasis in training should be placed.
7. The probable number of pupils who will have most or all of their important writing done by a typewriter in later years.
8. The quality of writing, according to a scale, which business men and other persons in the community consider minimum.
9. What methods work best in getting pupils to do their best, rapid, and accurate writing in *all* class exercises?
10. Post the Thorndike and the Ayres scales for measuring children's handwriting on the wall where pupils can measure their own writing and encourage them to do so. Another method is to place a scale under a large pane of glass on a table, or to frame the scale.
11. If the principal writing that pupils will do is in the form of correspondence, how much of handwriting and composition should be letter writing?

There are broader problems for investigating which could be carried on in the same school system or among different systems, which would determine the relative value of different methods of instruction as advocated by leading penmanship supervisors, but these do not come within the province of the individual teacher.

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CHAPTER V

COMPOSITION

Preliminary Problems

1. Why do many teachers regard composition as a study suitable only for the higher grades of the school?
2. What are the chief values of composition?
3. What are the typical social situations demanding communication of ideas in speech or in writing?
4. What should a particular individual speak or write about?
5. How does a trained writer proceed with the revision of a manuscript before submitting it for publication? Why should children proceed in substantially the same way?
6. Why should children be permitted to read their compositions to their classmates?
7. As a topic in a course of study, which is better: "Exposition," or "How to make people understand you"?
8. What objection is there to beginning a composition exercise with the study of a classical "model"?
9. What should be included in elementary composition—grammar?
10. What is the purpose of a composition "scale"?
11. Since composition is a part of all studies, why have special classes in it?
12. Why have vocational topics proved useful in composition work?

I. The Nature and Value of Composition as a Subject

Composition, Not Language.—There is a great deal in a name. The growing tendency to employ the word composition to designate certain elementary school activities should be encouraged. The word is to be preferred to "English" or "language," because it is more precise and more suggestive than either. "English" has fairly established itself as the inclusive term for all school studies in which the mastery of the vernacular for either practical or esthetic uses is the

chief end. Like science, it serves to denominate several related subjects, as, for example, reading, literature, and oral and written expression. "Language," on the other hand, calls to mind the external forms of speech and writing. The word suggests inflection, punctuation, the use of capital letters, the choice of synonyms, etc. It has for many also the associations developed by contact with those nondescript collections of facts, pictures, poems, blanks to fill, dictations to write, passages to copy, and stories to reproduce which have, for a generation, been supplied to children in the last four or five years of the elementary school as text-books in "language" or "English." It is high time for a change both of material and of name.

The new name should be composition. This name should be consciously and definitely applied, not alone to the preparation of written papers in the higher grammar grades, but to certain activities in all grades. Even primary teachers, who have been all the while inducing and guiding compositional activities, should have no scruples about employing the term.

That they do have such scruples was recently demonstrated. In a system of schools employing over a hundred teachers, "round tables" for the discussion of the various elementary school subjects were announced, among them a round table on composition. To this round table not a single primary teacher came. Inquiry disclosed the fact that these teachers understood the term as applying only to the writing of "themes" in the upper grades.

What Composition Is.—As has been hinted above, composition is a fundamental activity, not confined to any grade or stage of learning, nor even to the school. It is primarily a mental process, and only secondarily a matter of speaking or writing. It is in part identical with thinking, and with much of what is properly called study. It is analogous to house-building, cabinetmaking, landscape-gardening, and all other arts, industrial or fine. Like these arts, it involves the

development and organization of ideas, and the giving to them of an appropriate, an effective form of expression. It is, then, first of all a process; afterward a product. It is practised by every normal human being of every age, except that of earliest infancy; and, while capable of being reduced to formal rules and laws, it is learned chiefly by imitation and is in large measure a matter of habit, not of consciously directed effort. It involves the use of language, and hence is hindered or helped, as the case may be, by the degree of mastery of vocabulary, sentence idiom, and other units of form which the individual has attained. It is essentially a social activity; men speak or write in order to communicate. Hence it functions only where a genuine social relationship exists [29 : 1–5].

The Value of Composition.—From the point of view of the elementary school, composition is primarily a means for the establishment of certain important habits. Among these may be noted the habit of observing, that is, of seeing curiously and thoughtfully. Here composition is a powerful ally of all other school studies. Nature study, for example, may tend to make children observant of certain classes of natural phenomena. But scientists, as everybody knows, are not keen to notice objects outside of the range of their special interests. Artists are equally narrow. Composition, however, may be made inclusive, and therefore broadening. In order to depict or explain you must see.

As implied above, composition may strengthen the tendency to reflect, to turn experiences and ideas over in the mind so as to perceive their meaning and relationships. This is seeing in the deeper sense. Not all attain to any degree of power in doing it, even in mature years, but the foundation of the habit may be firmly laid in composition if anywhere—much more firmly laid than teachers generally suspect [1 : 123–4].

The tendency to weigh and judge the value of statements may be promoted also [32, 33, 34]. Composition means

selection. Among the ideas which association presents, some may be included, many must be rejected. Conscious choice implies standards and the custom of referring to them. This means, in other words, that composition is logical, consistent, must convince, and hence must appeal as valid. In a word, it must seek to be truthful.

More obviously the practice of composition leads to obedience to good usage, to the choice of expressions agreeable to one's fellows because understood and approved by them. It enormously increases the possibilities of thought and feeling by furnishing the vehicles in which thought and feeling are carried. Thus life is broadened and enriched, and the possibilities of intellectual intercourse multiplied a thousandfold. Freedom of expression is ultimately the gauge of a man's education [16a: 170–187].

II. Method in the Teaching of Composition

How Method in Composition Is to Be Discovered.—The discussion of the teaching of composition cannot proceed worthily except upon the basis of the fundamental assumptions which have been outlined in the preceding paragraphs. Method is not merely a matter of personal idiosyncrasy, but of rational procedure. In the nature and purpose of the subject itself method is to be discovered. A clear view of the values to be realized and of the psychology of the process of gaining control of them will provide us with the principles in accordance with which details of classroom technic may be consistently worked out [8, 36].

What is the essential process of composition? First of all, there must be an occasion for communication. Men speak when they have something to say and somebody to say it to. When Jennie, aged five, wishes to play with her small neighbor, she makes a convincing plea and mamma consents. When Ralph's baseball team wins from its rival, the boy gives the people at home an enthusiastic account of the victory. The older sister falls in with her chum on the way to

school and enters into an animated conversation about plans for a new spring costume. Meanwhile papa discusses politics or business with an acquaintance while journeying to the office, and later in the day mamma attends the club and reads a paper on the Irish Theatre. Evening finds all at home, and, more likely than not, one or more of the family occupies the time in writing letters to distant friends. These are some of the ordinary occasions for composition. Strange that the school should have so formalized a process which is essentially spontaneous, natural, and enjoyable.

An Outline of Method—Real Composition Situations.—The first step in teaching composition, then, is to create, or seize upon, situations in which expression in speech or in writing is urgent and gratifying. They are numerous and near at hand. Everybody likes to tell about himself and his own experiences; everybody likes to give welcome information; everybody likes to entertain, to merit approval, to carry his point, to play a part, to add to his possessions, to reciprocate a favor. If only the class period is conceived of as a meeting of friends, not primarily as a formal recitation or testing place, real situations for composition will present themselves. *Socialize the composition hour* [9 : 26; 29 : 36].

This does not mean, however, unbridled license to immaturity. Socializing is an active, not a passive process. The teacher must lead in it, not merely keep hands off. She will help her pupils to find both the occasion and the topic. She will suggest, arouse, start ideas to working, point the way to the raw material, discover to each his proper resources. In short she will neither make formal assignment of topics nor leave raw boys and girls, who have little conscious command of their powers, to grope about or stand helpless, unaware of their possibilities. On the contrary, she will reveal each to himself, for it is her business to know her children. The boy who sells papers, or who spends his summer on his uncle's sheep-ranch, or who makes a garden and sells vegetables, will be encouraged to transmute his unique experience into the

gold of human speech. Likewise the girl who feels certain that she has nothing to say will be helped to find in her personal interests that which it is worth while to tell about [31, 41].

Time Necessary.—But neither the boy nor the girl should be expected to do this without reflection. Why teachers should require of children what the veteran of the platform never undertakes will always remain a mystery. Webster replied to Hayne extemporaneously. He had but to reach up, so he declared, and seize thunderbolts to hurl at his opponent. But for many a month he had been forging his thunderbolts for just such an encounter. Given the occasion for speech and the fit topic upon which to discourse, there must follow a period of incubation, time for the idea to develop, to take shape, to gather to itself appropriate details. And these must be ordered into somewhat of system. There must be a plan. One idea must come first, another follow, and so on to an appropriate end. All of this takes time and consciously directed effort. Babbling on like Tennyson's brook will never accomplish it.

Nevertheless, it cannot be done by rule. It is, as has been suggested above, a matter chiefly of imitation, of habituation; children learn to do it by working sympathetically with others who have the secret. Little by little they become conscious of the process, and bend the will to it. The primary teacher is herself orderly, systematic. Her board lessons have unity and coherence. Her stories proceed by well-defined units. Her explanations are clear and logical. She holds the pupils to the point, draws them back on the track, discourages wandering, challenges their thought, questions them, makes them think things out, turns a deaf ear to foolish, half-baked assumptions, praises the thoughtful, the orderly, stimulates right intellectual activity. She lays—or ought to lay—the indispensable foundation. Hence she should know the principles of effective composition; she should have a clear vision of the goal toward which her protégés are

moving. Above all she should know the psychology of language. Otherwise how can she understand the immense importance of the informal methods by which right habits of thought and expression are to be established long before a single rule is learned [9, 18, 23, 32, 39].

In this is to be found the answer to the question so often asked: Shall I correct grammatical and other errors of speech at the time they are made? Generally, yes. Supply the correct form. Cause it to be spoken by the child in its proper connection. Save all those present from the influence of a bad example while you seek to establish the right habit in the offender. But do it tactfully. It is not necessary or desirable to upset Frank's train of thought in giving him the expression he needs. The teacher is his living dictionary, and a much better one than any printed book can be for many a year.

But will the tactful correction do any good? Yes, if quietly persistent. It should, however, be followed up by language games, in which errors which are found to be troublesome to the whole class are practised upon. Not formal lessons with generalization, note, but drills, repetition, with attention focussed on the form and with all the zest which ingenuity can arouse. Let one row ask questions of another which will require "I saw," "I have seen," etc., in answer. Choose sides to see who can make up the most sentences involving "were," and so on [1: 29].

In the first three years of school, it may almost be said, the composition battle is lost or won. Almost, we say, because the work of the years to follow is indispensable. Step by step the learner must master the technic of the craft. Mere informal direction will not suffice—not for the many, at all events. The pupil must learn what the tools are and how to use them. Not apart from actual life, be it said again, but by employing them for purposes as real and as worthy as later life will ever afford. Juggling with the forms of language is a poor substitute for actual communication.

The time for William's account of his visit to the country is necessarily short. Therefore William can tell about only a single experience. Let him choose the breaking in of the bay colt. That will be interesting, especially if William puts in the details which will enable all to picture just what happened. Thus he learns to narrow his subject and to treat it concretely. Mary is to report in the assembly on how the class has managed its window-boxes. What do the members of the class want her to tell? She puts her outline on the board. It is criticised. All learn how to plan a speech, using the standard means of ordering a body of ideas. So it may be with the hundreds of facts and principles which the children should master. The need of them arises; they are clearly taught through use; and afterward, being consistently called for and required, are fixed for all time.

Note the importance of publication in all of this. Consciousness of my audience, of what is due to them, of what is necessary on my part to win success, this and this only will lead to conscience for form. I must win the approval of my audience, otherwise what matter? Let the teacher who piously prates about correctness for its own sake consider herself as she would be wholly apart from social influence and social compulsion. Morality *in vacuo* may be made to appear plausible in the abstract but nowhere exists in reality. *For my audience* I must prepare to speak clearly and correctly; *for my reader* I must write out a fair copy [30].

Which suggests another of the foolish practices of the school, namely, the demanding of perfect first drafts without time even for reflection, much less revision and sober second thought. What no practised writer ever does, not even the hectic newspaper penny-a-liner, the fledgling of the elementary school is expected to undertake. The burden of dealing with half-matured, wholly restrained and stiffened writing might have been expected to force a reform long ago, but tradition is powerful, and teachers have not been much in the habit of criticising their methods by the

Something interesting to do and to talk and write about in Montclair, N. J.

light of life without the walls. Not of course that there should never be writing wholly spontaneous and unrevised, but certainly not more of it than is common with adults, and not under circumstances which are not readily duplicated outside of school. Let children make notes. Let them dash off first drafts. Let them revise their own work. The man who submits for publication the first-fruits of his brain is rare—a myth, in fact, a mere creature of superstition. To take him for the model of the mere beginner is indefensible [23, 29a, 31].

Judgment by One's Peers.—And let the work be passed upon by a jury of the writer's peers. True, the teacher must act as judge, but she will do well to remember that it is the decision of the speaker's or writer's classmates which weighs. It is to them that he appealed. They are his society, his associates. Their standard cannot reasonably be thought too high.

Moreover, the members of the class need to exercise their judgments. The impression of one is speedily corrected by that of another. Each marvels that so obvious a fact should have escaped his observation. There was never such a training ground for the exercise of fairness, courtesy, tact, and the spirit of helpfulness. Here is opportunity for the intimate exercise of the duties and privileges of citizenship.

Perhaps no method of class criticism equals in effectiveness that of group work at the blackboard. It begins in the first grades with the teacher herself at the board writing for the class. Later a good penman among the pupils may take her place, or several pupils may put their work where all can see. In the higher grades it is well to divide the class into small sections. Let one member of each section write a short composition which he has prepared, while the other members make suggestions as he goes along. The teacher should go about to settle moot questions and see that there is no lack of serious attempt. Those who have not tried it have no idea how effective this method is in improving the technic of writing [11].

Summed up, the main principles of successful method in the teaching of composition are these: (1) Provide real situations for oral and written expression. (2) See to it that each pupil finds a topic upon which he has, or can get, abundant information, and that he attains to a definite, specific point of view from which to treat that topic. (3) Allow sufficient time for the topic to develop in the mind of the speaker or writer, and make sure that the ideas take shape according to some workable plan. (4) Then, and then only, encourage the composer to clothe his theme in appropriate details of language and to put it before his hearers or his readers. (5) Depend in large measure upon the pupils themselves to make upon each performance the criticisms which will enable the individual to improve. The teacher should encourage where possible, and should show each how to correct and revise his work [1, 3, 7, 9, 18, 27, 29].

III. The Course of Study and Standards of Attainment

The Course of Study.—Many other phases of our subject which are now frequently discussed remain to be touched upon. If, however, the doctrines set forth above are accepted, the remaining questions may be somewhat summarily disposed of. What of the course of study? The answer is that a course of study is a series of experiences through which the learner moves to the realization one by one of consciously prized values. A course in composition, then, is something more than a collection of facts and principles of language expression scattered more or less arbitrarily over a certain school period. In a very real sense the course in composition is made up of subjects to be treated rather than of forms of language to be learned. It is, however, neither alone. It is the handling of subjects of vital interest in such a way that step by step, as the maturing intellectual life of the child permits it and demands it, mastery of the forms of expression is actually attained. At the beginning conscious

knowledge of technic is brought very little into play. With the passing years this knowledge matures, but nowhere is it worth while to give it as pure science, as facts cherished up against the day of possible use. The effort to give command of such technic as the needs of communication actually demand will be found more than the teacher is ordinarily equal to [23, 32, 37].

How absurd it is, then, to attempt to deal with the "forms of discourse" in the grades—one might venture to add, in the early years of high school [17, 35]. What children need to learn is how to tell a clear and connected story, not how to state the theory of prose narrative, and how it differs from prose description; to make people understand or believe them, not to define exposition and argumentation, and to discourse upon the methods of carrying these on. The study of composition is mainly well-directed and tactfully criticised practice in speaking and in writing, not the reading over of statements of rhetorical theory derived from an examination of the work of successful writers [11].

The Use of Models.—But is not the use of models praiseworthy? Yes and no. Nothing so completely prevents originality and the free play of one's own ideas as first to read what another has written and immediately after try to write something similar oneself. Especially is this true if the writer of the "model" is a master, and has treated the subject in a manner far beyond the present powers of the learner. It is far better frankly to attempt to reproduce what one can remember of such a model than to pretend to imitate it [13, 29].

There is, however, a legitimate and important use for examples of good writing in the elementary course in composition. The study of the "model" should follow, not precede, the attempt of the learner. Once he has his own ideas collected and expressed, the reading or hearing of the words of another will but lead to revision and improvement, not to paralysis, of individual effort. The model, moreover, should

not be too far beyond the present powers of the pupils. For most of the class the work of the leaders of it will suffice as stimulus and example. For the sake of the leaders, however, there should be provided also specimens of the work of somewhat more mature writers, preferably that of other students or of the teacher, and these models should be used merely to suggest larger and better possibilities of method and treatment rather than details of technic. Imitation of style is only for the specialist. Until the text-books provide them, teachers should be enabled to have pieces of good work duplicated at will, in a form to be placed in permanent books kept by the pupils.

Such examples may be chosen partly to serve the purpose of dictation. The danger in this exercise is, however, that it will become entirely perfunctory, a time-killer. Dictation is valuable mainly for drill, and hence should be employed only when there is a particular fact or usage to be drilled upon. The pupils should know exactly what this is, and should study the example carefully with this in mind before it is read to them. They should then pass judgment upon their own work to determine the degree to which they have mastered the form or principle, and the drill should proceed just so long as it is actually seen to be needed and no longer.

Correlation with Literature.—These examples, it will be seen at once, are not to be mainly "literary." It is a pretty sentiment, now much cherished, that the study of poetry is the chief means by which children are to acquire the power of oral and written expression. One is in danger, no doubt, of appearing ungracious to attack so sweet a dogma, but a moment's reflection will make it clear that, Wordsworth to the contrary, the language of poetry is not the language of common life, however poetical the language of common life may be. Literature, except for the homely folk-tales and fables of the earliest years, and the prose hero-tales of the middle grades, is at best an indirect means of language train-

A great opportunity for oral composition work in an open-air kindergarten of Sacramento, Cal.

English in any school of foreign children is a big problem. A school built of concrete in the Philippines

ing, and should be permitted to occupy its own place on the program, as geography does. The time of the composition hour is needed for such activities as have been described above. Once the teaching of composition and the teaching of literature are merged, there follows, almost inevitably, neglect of practical training and dependence upon a vague influence which is never tested or measured, and which has far less value in every-day expression than is commonly ascribed to it. Literature must not be substituted for composition merely because teachers find it more to their taste or can arouse greater enthusiasm by means of it. Let the example of the quack who threw all of his patients into fits because he was death on fits suffice as a solemn warning.

The Place of Grammar.—This same example might well be cited also to those who persist in parsing and diagramming. From what has already been said, it must be evident that the present writer has no faith in formal English grammar as an isolated science to be studied by children. The investigations which have been made throw the gravest doubt upon all the claims which have been set up for formal grammar as an elementary school subject [24]. The fact seems to be that the principles of grammar, like the principles of rhetoric, are of value only as pupils grow up to and into them through their own experience. Good speaking and writing obeys standard grammatical usage; there can be no doubt about that. The only question is: In what way can boys and girls be most effectively aided in attaining to grammatical correctness in their speaking and writing?

The answer seems to be: Neither by ignoring grammar nor by apotheosizing it. Just as in the case of rhetoric, the beginnings are made through informal correction of errors and the setting of a good example. Standard terms, not baby talk, should always be employed. If this is done, grammatical concepts will gradually define themselves in a purely objective way, as other concepts do. A child does not wait until he may take up the study of cabinetmaking and master

a formal definition to learn what a chair is. "Sentence," "subject," "predicate," "noun," "verb," "conjunction," "modifiers," and many other grammatical ideas should come to him in the same way. And when he does take up formally the study of grammatical principles, it should be in the closest connection with his practice of composition, and with constant application thereto.

What topics in grammar it is worth while to emphasize investigation must determine. A good beginning upon such an investigation has already been made and should be carried forward everywhere [10, 19]. With the definite aim before us of including in the course of study such grammar study as can actually be made to function in composition, and this only, we shall beyond doubt be able to learn in the near future how much of English grammar we ought to teach.

Already two classes of topics are clearly defined. One of these includes those inflected forms in which error is common and difficult to avoid. Such are the tense forms of verbs and the cases of pronouns. The other involves the so-called "sentence sense," the clear perception of a thought as a completely expressed unit, a group of words made up of subject and predicate. This is, of course, conventional. One may make himself fairly well understood by means of gestures and ejaculations. But civilization communicates by means of sentences, and to this standard it is necessary to attain. It is best also for the sake of the sheer power to think.

Standards and Grading.—The settlement of the grammar question will leave behind the question of when a pupil is up to grade. At present nobody knows. The startling variations which will result from the attempt of any group of teachers to mark any set of pupils' papers are now familiar to everybody [28]. A beginning of scale-making has been made, but the pioneer attempts leave much to be desired [2; 21; 24; 28; 38]. The important fact is that a method of arriving at a scale has been suggested, and during the next decade we may expect to see the practice of local conferences

of teachers and local scale-making become common. All the teachers of a school should know by what standards the work of pupils is to be judged, and should mark papers with conscious educational purposes in view, distinguishing clearly between grades for teaching and grades for testing. By means of suitable collections of typical compositions, which have been filed with comments as to their production and respective merits, it will become possible to maintain in a school standards for promotion that shall be reasonably free from mere individual idiosyncrasy, not to mention temporary mood or caprice. As it is, the teacher may only pray to be forgiven for the unintentional injustice which she does each year when she makes out her pupils' standings in composition.

Why Have Composition Classes?—There are those who would abolish the teacher of composition. It is, say they, not a formal subject at all, but merely incident to other activities, in connection with which it should be taught. The *theory* is plausible but the *thing* has not been done. The principal limitation is found in the power of attention, which somehow cannot be focussed upon several things at the same time. History, it will be granted at once, affords excellent opportunity for the organization and expression of ideas. In the history class one may teach the outline, the use of the full sentence, correct forms of verbs and pronouns, punctuation, etc., etc. The difficulty is, first, that enthusiasm for getting on with history invariably prevents adequate attention to these things. If the pupils know them, they may be required to use them, but never will it happen that time for teaching them adequately will—or should—be taken in the midst of an absorbing historical thought movement. Besides, history is only one phase of intellectual interest; there are dozens more. Many of these fall quite outside all organized school subjects. Composition alone is fitted to give opportunity for the expression of the whole range of one's interests, to say nothing of its limitless possibilities for broadening that range. And lastly, while the body of composition

technic of which elementary pupils should have a systematic knowledge is relatively small, there is such a body, and it will never be ordered into a working system by means of incidental treatment in connection with the various school subjects. These subjects offer rather the opportunity for using and fixing as habit the conscious knowledge of technic which the class in composition has developed. This they must on no account fail to do.

Vocational Guidance and Composition.—Enormous possibilities for training in expression appear in a subject which at present lies partly within and partly without the field of English Composition. This is the subject of vocational guidance or vocational outlook. With the raising of the compulsory age limit of school attendance, the school has been confronted more and more with the problem of assisting young people to find and prepare themselves for a suitable calling. Here is an opportunity, obviously, for extensive investigation. There are numerous occupations; they have their peculiar requirements and their unique possibilities. Few can claim acquaintance with many of them. Which is selected by a given individual is largely accidental. Few persons are definitely trained for a specific occupation until mature years, except as they leave school and take apprenticeship or employment in the humblest duties of the occupation.

Those aware of these facts and impressed with the duty of providing counsel, hit upon composition as the most available instrument. In the schools of Grand Rapids, Mich., more fully it appears than elsewhere, studies of vocations are carried on, and here composition has drawn most fully upon such studies for its material [15; 16; 42]. The various occupations to be found in the community are surveyed and reported by the pupils themselves, who learn something of the values of each. The lives of successful persons are read and reviewed. The pupil's own experiences as a worker are recounted. And not least of all, first-hand studies are made to determine the value of education to those who earn their

Something interesting to write about in real letters at Hackensack, N. J.

Studying conversational English in the Manila public schools. Bureau of Education, Manila, P. I.

living and attempt to render service to the community [15; 16; 41].

Such activities, with parallel studies in community civics and in the life of plants and animals, furnish the raw material ıd occasion of expression in the vocabulary and in the manner of common life. Coupled with the reading of literature and the making of stories, poems, and plays for the satisfaction of the emotional and esthetic life, they may serve to round out and give balance to a course in composition which is dynamic and fruitful because it is the expression of the child himself [33].

SUMMARY

1. Composition is a fundamental social activity, not merely a formal study. It is complex in nature, expression in speech or writing constituting only one of the processes involved. Its value, therefore, is very great; no other study is so well adapted to many-sided training of mind and body.
2. Method in composition should be deduced from actual social practices and psychological experiment. The first step is to make sure of a motive to expression. Time for the development and organization of ideas must be allowed. The pupil should revise his own work. Class criticism is more effective than the teacher's criticism. Help the individual.
3. The course of study should define purposes of communication and fields of subject-matter rather than facts and principles of theory. Technic should be only the handmaid of expression, not the dictator of it. Models should consist mainly of good but not exalted specimens of writing done by contemporaries, and should follow rather than precede the attempts of the children to carry out similar purposes.
4. Grammar should be regarded as a part of the composition course, and only the topics really useful should be included. The accuracy of grading will be greatly increased, it is believed, by the development of scales made up of samples of composition. Classes in composition will always be necessary, as in the case of other arts. Topics for such classes should, moreover, have definite informational or literary value, as in the case of the study of vocations.

PROJECTS IN APPLICATION

1. Examine several courses of study for the elementary school in order to discover what conception of the nature and value of composition each embodies.
2. Examine several text-books in the same way.
3. Learn, if possible, how well-known writers practise their art.
4. Classify the possible subjects for oral and written composition by children, and write out ten topics with as much variety as possible under each class.
5. Select a general subject—outdoor sports, for example—and limit it so as to secure a definite topic capable of being treated from a specific point of view. State the point of view in a full sentence.
6. Trace from the first grade to the eighth, the possibility of teaching the use of the outline, writing two examples for each grade.
7. Select six models of different kinds of writing for a certain grade and write a comment on each, setting forth its merits and its possibilities for class use.
8. If possible, secure a set of children's compositions substantially alike in main purpose, and grade them on the scale of a hundred, deciding beforehand how you will apportion credit for thought, structure, treatment, and mechanical correctness. Then compare your grades with those of several other persons and construct a table of averages.
9. What is the relative value of letter writing in composition?

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36. O'Shea, M. V.—"Linguistic Development and Education." Macmillan Co., $1.50. (See especially the chapter on "Development of Efficiency in Oral Expression.")
37. Sheridan, Bernard M.—"Speaking and Writing English." Published by the author at Lawrence, Mass. Price, 50 cents. (A suggestive course of study with samples of standard work.)
38. Starch, D.—"Educational Measurements." Macmillan Co.
39. Swift, E. J.—"Learning and Doing." Bobbs-Merrill Co., $1.00. (A good presentation of the general view-point from which composition should be regarded.)
40. Taylor, J. S.—"Composition in the Elementary School." A. S. Barnes Co., 90 cents. (A body of material compiled by one of the New York School superintendents.)
41. ——— "Vocational Guidance Work in the Grand Rapids High School." *English Journal* [3 : 507]. (An outline covering the seventh and eighth grades, as well as the years following.)
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CHAPTER VI

GRAMMAR

Preliminary Problems

1. What are some opinions regarding the teaching of grammar in the grades which you have recently heard expressed? What conditions make an opinion in such a matter valuable?
2. What percentage of school systems require grammar to be taught in the elementary schools?
3. What proportion of children who study grammar in the grades go on to a study of rhetoric and foreign language?
4. Can you give concrete examples, from your own experience or observation, of help in expression through the knowledge of grammar?
5. According to your observation, how thoroughly are the grammatical facts in the course of study mastered by the children? By the teacher?
6. At what point in the grades, if at any, should the classification of grammatical facts begin?
7. What are some differences in methods to be used in teaching a science and an art? To what extent should children be taught *how* and *why* they are to do certain things in such a subject as music, drawing, or composition work? To what extent should their work in any art be spontaneous? Imitative? Deductive?
8. In what ways is the teacher's problem in English teaching different from that of the educated mother in a good home?
9. At what age are pupils most capable of learning grammar readily and utilizing it in improving their discourse?

I. The Present Standing of Grammar

The subject called grammar differs so greatly in different schools that any discussion should begin with a definition. In this chapter, *grammar* is understood in its accepted sense as denoting the science of language. Modern English grammar, then, is the orderly arrangement and classification of the

present facts of the English language. The definition immediately suggests the insistent questions that are propounded by the modern scientific spirit in education: Has this science of language any place in the elementary school? If so, what place? Every intelligent teacher should be aware of these questions, and of the attempts that have been made to answer them. Thousands of teachers are required to teach grammar. It is important for them to understand its present place in the school and, if possible, how to make time spent on it worth while.

The chief reasons given for keeping grammar in the elementary curriculum, aside from a mere deference to tradition, have been: (1) That it contributes more than anything which can be put into its place to the aims of education; (2) that it is in itself an interesting and useful study for children; (3) that it provides a necessary, or at least a desirable, preparation for the study of rhetoric and foreign languages; (4) that it contributes to a mastery of the art of speaking and writing correctly; (5) that it introduces children to the methods of scientific thinking, using material familiar from babyhood. Two other claims sometimes made—that grammar is helpful in the study of literature, and that its terminology is indispensable—may be dismissed with the stating.

With regard to the first and second reasons there is at present very little difference of opinion: the mere facts of grammar are *not* of sufficient interest and usefulness to the majority of children to justify their being taught in the elementary school. The third reason is valid for the minority of pupils who are to study rhetoric and foreign languages; therefore this reason alone would justify a fairly thorough course of the right kind for such children in places where a goodly proportion of pupils continue their education beyond the eighth grade. Certainly this important minority should not be overlooked in planning a course of study. Some consideration of their interests is likely to result from the present

movement for a better articulation between the elementary and the high school courses in English, the one subject continuous throughout the twelve years. The movement for the unification of grammatical nomenclature also has regard chiefly to the ever-increasing army of high school and college students. But in a large system of schools the course must be planned for the greatest good of the greatest number, perhaps subject to modification for special localities. Since the great majority of children never go beyond the eighth grade, the only reasons that can be valid to give grammar a place in the course of study are the last two: its usefulness for training either in logical thinking or in practical mastery of the language.

Claims Challenged.—These two claims have recently been challenged by students of education, with interesting results. First, there are those who, reasoning either *a priori* or from observation, declare that training in logical thinking in one field will not lead to logical thinking in another field; that the field of language facts is too remote from life to be important to children; that logical thinking in that field is beyond the power of children anyway; and that the practical results of the study of grammar are not discernible in oral or written language work. Then there are other students of education who, believing that *a priori* reasoning on such matters is futile, have set themselves to test these last claims of grammar by experiment. Supt. Franklin S. Hoyt, experimenting with two hundred pupils entering an Indianapolis high school from practically every grammar school in the city, found that the influence of the scientific grammar taught in that city was approximately zero as applied to composition work and the interpretation of language. The results of this experiment were corroborated by Doctor L. W. Rapeer's tests conducted in 1906 with two hundred Minneapolis pupils. More recently, Professor Thomas H. Briggs, of Columbia, in a series of ingenious experiments has investigated the effect of scientific grammar upon thinking ability. He discovered that

the measurable improvement of the children in logical thinking was approximately zero.[1]

If the evidence of these experiments be accepted as final proof, it would appear that scientific grammar, as such, has no place in the elementary school, except where a large proportion of the pupils go on to high school. It should be remembered, however, that the experimenters themselves do not claim to have proved positively that grammar, even as now taught, is entirely valueless for elementary school children; they claim only that their experiments tend to show this. In a matter of values so extremely complicated, a very large number of experiments would be requisite to a sound conclusion, as any scientist will affirm. Still less have these experiments proved that grammar as it might be taught could not train pupils to think logically about spoken and written words at least, or give them some tools of general use in scientific thinking, or improve their oral and written English. As to whether the most carefully selected and arranged course in grammar, well taught, can be made to do so, and to do so in a sufficiently high degree to deserve a place in the crowded curriculum of the elementary school, only further careful study can determine. It is very doubtful whether such a question is capable of being answered positively and finally and for all cases now, but a sincere attempt to get at the truth cannot fail to bring better results than those at present attained in the schools.

The Emergency.—Meanwhile, with a full course in the subject required in many schools, at least in the two upper grades, the teachers are facing the practical problems of what to teach, and how to teach it. If there is such a thing as a course of study in grammar, or a method of teaching it that will help to train the pupils in logical thinking, and more especially to give them a mastery of good English, what is it? Every teacher of English in the grades should consider

[1] See references in Bibliography.

herself an investigator into the possibilities of teaching the right facts of grammar in the right way to make them practical.

II. The Course of Study

Governing Principles.—The outline of an ideal course of study in this disputed territory is not within the province of this chapter; and indeed, as has already been implied, such an outline is still to be discovered. Moreover, most teachers are powerless in choosing a course; they may only modify to some extent, according to circumstances, a course laid down for them. Since, however, they may usually emphasize important matters at their discretion, they may find useful some general principles which must determine the course of study, and some specific suggestions. The subject must be taught in many schools, and we should as teachers make it contribute as much as possible to the aims of education.

1. Since it is evident that not all the facts with regard to the grammar of modern English can be or should be taught in the elementary school, only those facts should be chosen which are (*a*) important to a clear understanding of sentence structure, (*b*) useful, (*c*) comprehensible to the children.

2. In the lower grades every effort should be made to correct grammatical errors and to fix right forms by imitation and drill, with little or no attempt at explanation of reasons or at classification of errors. The important point is to make the right form sound right and the wrong form sound wrong.

3. A few forms should be assigned to each grade for mastery. Nearly all English teachers attempt to do too many different kinds of things and fail to give thorough drill on a few elementary forms. A careful study of prevalent grammatical mistakes should be made for each locality, and the few most common errors should be carefully distributed for correction in the several grades. A pupil in the sixth grade, then, should be held rigidly to account for forms supposedly mastered in the five preceding grades, and so on.

4. Since imitation and drill on a few forms are often insufficient to overcome the handicap of a pupil's home influences, reasons, explanations, classification, and rules, should be given to the older pupils; that is, scientific grammar used as a tool should help to govern practice when pupils are old enough to understand it.

5. Scientific grammar should be truly scientific as far as it goes. That is, no fact should be taught until it can be taught truly and in sufficient relation to needs of expression to mean something.

6. Children below the seventh grade as a rule are not sufficiently mature to deal with language facts scientifically, without unwise expenditure of time. All the necessary grammar can be taught in one year, or even in part of a year; but since this grammar should be closely and constantly related to the composition work, it is better to distribute it over the seventh and eighth, or, in the intermediate or junior high schools, the seventh, eighth, and ninth years.

7. In explaining the phenomena of the English language there is a logical order of procedure from basic facts to those that depend upon them, an order which cannot be changed without some sacrifice of clear understanding. While seeming to grow out of the composition work, the study of grammatical facts should perhaps be planned to progress from fundamental ideas to those that are built upon them. Yet development in language should not be subordinated to the sequence of the science.

8. Since in an analytic language like English the importance of the sentence to the meaning of the word can hardly be exaggerated, the sentence as the unit of thought is the unit in any scientific study of such a language.

9. To be of practical value, any study must be thorough. Therefore, since there is not time for all the facts, it is best to dwell at length on the larger facts of sentence structure, ignoring minutiæ.

10. No fact need be taught that has not some direct bear-

ing on the use of good English. Too often, however, it seems to be assumed that the only practical grammar has to do with the forms of words, and that the only test of its efficiency is its influence on correctness of oral speech. All knowledge that may be applied to the construction of good sentences, to proper punctuation, as well as to the choice of right forms of words, and that does not crowd out more valuable knowledge, is practical.

11. The study of the parts of speech as such may well be limited to such facts as have to do with the choice of right forms. If this plan is followed, complete parsing will generally be found as impossible as it is unnecessary.

12. For those who are interested and who have some feeling for the integrity of subject-matter, and for all those who expect to teach, there should be provided somewhere in the high school a thorough elective course, to which the children can be referred when they question the gaps in their knowledge.

Specific Suggestions.—Some teachers may like to see listed the most practical material of grammar, together with specific applications to the language and composition work. They should remember, however, that none of it is likely to be practical unless it is made so by constant application of knowledge to practice. Children do not usually apply the general to the particular, the knowing to the doing, unless they are taught and required to do so.

Sentence Analysis.—Of the matter usually included under sentence analysis, everything is practical that helps to develop the sentence feeling, the grasp of essential elements, the recognition of subject and predicate, and of predication or assertion as such. This last notion is necessary to the correction of errors caused by confusion between the past tense of the verb and the past participle, which can never assert. In a study of the grammatical errors made by Kansas City school children, Professor Charters of the University of Missouri found that 1,426, or 24 per cent of the total errors re-

ported in oral English, were made by the confusion of these two forms. Complete predication is what distinguishes a sentence from a phrase or clause. When sentence-sense begins to be achieved it should be turned to account in a final assault on the comma blunder, and its opposite, the amputated phrase or clause. Mr. Charters found that 30 per cent of the errors in written work, 3,600 all told, consisted in the failure to put a period at the end of a sentence. No pupil should be permitted to enter business or high school making this mistake in his writing.

Pronouns, Possessives, and Appositives.—When pronouns are first considered, some matters pertaining to clear reference of pronouns to their antecedents and afterward, at least in written work, every pronoun whose antecedent is not immediately clear should be challenged. *It* and *this* and *which* are peculiarly liable to obscure or weak reference. Possessive modifiers and appositives are obviously practical. Perhaps no simple and well-known rule of punctuation is more frequently violated than the one that concerns the use of the apostrophe with the genitive, or possessive, of nouns, and its omission from the corresponding pronoun forms. The rules for these cases and for the comma with appositive words and phrases have probably been taught long before the seventh grade; but if, as is likely, the application of these rules has not been made habitual with the pupils, the new emphasis that comes from meeting the constructions in grammar may be utilized to give purpose to thorough drill. It should be noted that the Kansas City study brought to light the fact that children use the appositive scarcely at all, and hence made scarcely any mistakes in punctuating it. For this reason it is struck out of the course, by those who made the study. However, it is a useful construction; and it would seem better, perhaps, to teach the children to use it in their written work correctly, to avoid wordiness in many sentences. Older pupils do use it, and fail to punctuate it correctly.

Clauses.—The study of clauses has important practical bearings. When adjective and adverb clauses are first met, their recognition should lead to freer use in compositions, driving out some of the stringy compound sentences of childish writing. As they are taken up in greater detail, one of the most important and difficult of distinctions should by all means be insisted upon—that between restrictive and non-restrictive modifiers. When this is thoroughly understood, it can be applied in punctuation. The discussion of noun clauses gives opportunity for new drill on the punctuation of direct and indirect quotations. Of adverb clauses it is the meanings that are important. The relations of *if* and *though* clauses—that is, the real notions of concession and condition —are almost new to many children. Again, and more specifically than at first, the study should lead to freer use of clauses, to the occasional substitution of *though* for *but*, to the more definite expression of relations. Eighth-grade children can be interested and profited by such application of their grammatical knowledge, if they really have the knowledge. The right use of *as* and *as if* as clause connectives, instead of *like*, which should never introduce a clause, may well be emphasized at this point; and *until* instead of *before* may be given some attention in places where it is misused. There is no reason, either, why the subordination of the truly subordinate should not be insisted upon; any eighth-grade child is capable of understanding that to say, for example: "I was walking down the street when I saw an automobile accident" gives a false emphasis to the less important idea. The placing of subordinate clauses for coherence and emphasis is well within their grasp, though the abstract rhetorical terms need not be used.

Practical material in the study of the parts of speech is chiefly: correct plurals; capitals for proper nouns; the possessive case; case forms of pronouns for subject, predicate attribute, object, and object of a preposition; matters of agreement; choice of adjectives and adverbs; matters of

tense; choice between past participle and past tense; choice between transitive and intransitive verb forms (*e. g.*, *lie* and *lay*); principal parts and conjugation of certain verbs (*attach, ask, drag, drown*, among those perfectly regular); correct formation of certain verb phrases (*e. g.*, *must have gone* instead of *must of went*); right uses of the passive voice; and, perhaps, proper grammatical and logical subjects of verbals, the genitive with gerunds especially.[1]

Throughout the study, after compound elements are introduced, there should be much drill upon proper subordination and co-ordination, the proper junction of verb with verb, subject with subject, phrase with phrase, clause with clause, sentence with sentence. If children have been taught to write freely and sincerely in the first six grades, they may well begin to take thought for the structure of their sentences more consciously in the work of the last two years; and if they are taught to keep their attention primarily on the thought to be conveyed and on the reader to whom they are conveying it, and to consider sentence structure only in revision, they need not sacrifice sincerity and spontaneity to correctness and effectiveness.

The teacher who has well in mind the whole list of practical applications for the year's course can collect in advance abundant material for drill from the children's own speech and writing. An example of a comma blunder, a mistaken verb form, an adjective for an adverb, or some other error from the children's work may well serve to introduce a careful study of each point in grammar. The grammatical knowledge once given, must be tested and applied in special exercises, and then carried over into original language and composition work, oral or written, or both. Perhaps it may not be out of place at this point to remark that the same kind of English should be required in all classes as is required in the English

[1] See list of practical grammatical facts as determined by the errors of Kansas City children, appended, pp. 156–161. See also lists in chapter I.

class. All oral or written expression in school should be part of the course of study in English.

III. The Teaching of Grammar

The consideration of the application of grammar to composition work has led us inevitably from the course of study to methods of teaching, since the choice of material depends very much on the use that is to be made of that material. Some more specific consideration of the teaching of this subject-matter is next in order.

1. **Requisites for Teaching.**—Of course a sensible plan of campaign is the first requisite for successful teaching. Next, in grammar, as in every subject, comes a thorough equipment of the teacher. For the teacher of grammar in the upper grades this will include real scholarship in the field—that is, more than a mastery of the particular text to be taught or of any elementary text, at least a passing acquaintance with the real scholars in English grammar; it will include also a competent grasp of the elementary principles of rhetoric and, for best results, the knowledge of at least one other language. Besides these attainments, the teacher must have a sense of proportionate values and needs, along with a clear realization of how much the pupils already have. She must be a student of her pupils' language habits. Imagination, an asset not usually included as necessary to grammar-teaching, is indispensable if we are to avoid "make-believe grammar,"[1] if words and sentences are to be what they are in real life, and not mere dried specimens. It is also needed here, as in any field, to illuminate a pupil's state of mind, and thus enable the teacher to forestall difficulties. Skill in questioning and ingenuity in devices both for presentation and for drill are in no subject more valuable.

2. **Aim and Point of View.**—The general aim in the teaching of grammar is easily deducible from what has already been said. The purpose of whatever training in grammar is

[1] See Bibliography.

given in the lower grades is to make the right forms habitual. The purpose of teaching English grammar in the upper grades in a more systematic way is to supplement such training by giving a thorough knowledge of such facts of the English language as apply to its intelligent use, and to teach these in such a way as to train the pupil in logical thinking, in so far as any systematic study can train him. Since language is the expression of thought, and especially since the English language is almost without inflection, there is no escape from thinking as the basis of all study of this language. The outcry against teaching logic in the elementary schools is liable to misinterpretation by many teachers. How much of the science of logic would a logician find in any widely used grammar? If the outcry means that sentences should be taught without reference to the thoughts they express—that is, to their meaning—it is palpably absurd. Consideration of English sentences is a consideration of meaning; and any other point of view will make the study of grammar merely mechanical, and therefore most useless and impractical. Real insight is necessary if a bit of knowledge is to be applied. The teacher's aim should be to give this insight, and then to take and to make opportunities for its use.[1]

The specific aim will thus differ with different lessons. In the lower grades, and in the same sort of work continued, as it should be, in the upper grades, the aim will be to impress the fact that one form in common use is wrong and another right, and so to fix the right form through repetition that it will at length be chosen unconsciously. In the upper grades, when presenting a new bit of grammatical knowledge, the teacher will ignore all future applications to concentrate on the clearest possible first impression of the fact itself. In first testing the pupil's knowledge after such a fact has been presented, the aim will be to examine this first impression and correct it if necessary. A drill lesson in grammar

[1] See the chapter on "Language and the Training of Thought" in Dewey's "How We Think."

will be designed to fix this impression. A lesson applying the grammatical knowledge to use will test the knowledge in the most thorough way. Its aim will be to fix good habits, and to root out bad by applying reason first and then by repetition. The final test and training is, of course, in the composition lessons, with which this chapter is not concerned.

3. **Motives.**—If the course of study is sensible, the teacher's equipment adequate, and the aim and point of view right, the question of motive will, for the majority of pupils, take care of itself. Perhaps hardly anything so stimulates effort as the sense of progress. Children in the seventh grade are susceptible to this feeling, and are quick to lose interest if their work appears to them haphazard and purposeless. To them no remote end is half so real as the immediate next step. The constant and systematic working up of grammar in making reasonable the corrections of practice will give a further and perhaps more vital motive. This will be true only if the children are held strictly accountable for facts once taught and drilled upon. For example, after the comma blunder has been thoroughly aired in the seventh grade, no finished paper in any subject should be accepted if it contains this error. It is human nature to take no more pains than the occasion requires. Grading should be just, uniform, yet increasingly severe, if effort is to be steady and increasingly fruitful. Children who are not susceptible to the motives of immediate interest, the sense of increasing mastery, of evident need, or to the stimulus of grades, must, of course, be penalized in some way—by detention or otherwise.

4. **Methods**—(*a*) *General Suggestions.*—Methods are merely ways and means of teaching. The most important general principle of grammar-teaching is that the pupils must by all means be made to think of meanings, to discriminate likenesses and differences, and not merely to memorize definitions and rules. For the purpose of this scientific study all kinds of specimens are readily available. These the pupil must

learn to examine and classify. For authority, step by step, he must learn to look into his own mind, not to a teacher, a dictionary, or any other guide. For each new step in analysis the inductive method is therefore the best.[1] For all drill and habit-forming, the problem of method is to make repetition and memory work constantly fresh and interesting with skilful devices. It is evident, then, that the teacher must adapt means to end, must have no stereotyped procedures—not Method, but methods. She must learn to keep still and let the pupil think when confronted with problematic matters for thought, but to exact instant response when the pupil is supposedly reciting from memory. She must learn to emphasize different material for different classes. For an eighth grade that has slipped through all the years without learning to write a decent business or personal letter to spend its time discussing the analysis of an interestingly idiomatic sentence like: "A few years ago men were a month travelling a thousand miles," is the height of folly; whereas another eighth grade, well ready for high school, might possibly be allowed to amuse itself and to test its insight with such a puzzle.

(*b*) *Some Kinds of Lessons.*—Outlines of various kinds of lessons may prove suggestive. It will be observed that what the teacher must do is always to see clearly the exact purpose of the lesson, the relation of this to previous lessons, and the probable difficulties. All the lessons outlined below bear more or less directly upon the same grammatical fact, and one that is fundamental. The lessons, as will be seen, are not consecutive. The first lesson should be followed by one on transitive verbs, and another on the direct object before the second is given. The examples in Lesson II are rather difficult, and may be simplified for inferior classes. Its only practical bearing is to sharpen the notion of *transitive*. The fourth lesson cannot be taught as given until

[1] See chapters on inductive and deductive lessons in Strayer's "The Teaching Process," also Chap. 7 in his "How to Teach."

principal parts of verbs and old and new conjugations have been discussed, but it may be modified to follow Lesson III directly.

Lesson I. Inductive

Special Aim.—To give the class a true first impression of the meaning of transitive. If attention is centered not on the *transitive idea* expressed by the verb but on the word following the verb—the object—classification will be haphazard and mechanical. Such verbs as *walked* and *cost* in "He walked a mile," "The book cost a dollar," will be felt as transitive. In presenting the idea of transitiveness it is best to use verbs in which the children do *not* make mistakes in form, in order to avoid confusion. Attention should here be fixed on the meaning, entirely without regard to words as parts of speech.

Basis Assumed.—An understanding of the sentence, subject and predicate, and verb.

Presentation.—(The idea to be presented is so new that it may be attacked without preliminary review.)

Teacher: We have often talked about actions, and about predicates (or verbs) that express action. To-day we need to discover two different kinds of action. Jimmy (to an unsuspecting and rather slow pupil), stand. (Jimmy stands, automatically.) *Tear.* (Jimmy looks blank; perhaps says something about a verb. The teacher quietly insists.) No, why don't you do as I say—tear. (Jimmy probably still stares blankly, while perhaps half the rest of the class begin to beam.)

Teacher (still quietly insisting): Jimmy, I told you to tear.

Jimmy (finally): I haven't got anything to tear.

Teacher (ignoring the *got* in the exigency of the moment): Somebody give him something. (A neighbor hands him a piece of paper.) Now, Jimmy, tear the paper. Why did you hesitate when I told you to tear? Why didn't you hesitate when I told you to stand? (From Jimmy and others in the class several statements, as clear as possible in answer to these questions.) What other acts can you put into the same class with standing, acts that involve nothing but the actor? (Writes *standing* on the board, and under it *sitting*, *walking*, *running*, *crying*, etc., as the class suggest them. If some have not seemed to get the point, some of the acts are actually performed.) What other

acts can you class with tearing, acts involving something besides the actor? (*Note.*—Caution is needed here, since many acts, writing, reading, etc., may be thought of either as transitive or as intransitive. For the moment, if suggested, they may be accepted in the transitive sense, unless some bright pupil objects; then they may be entered in both columns. A list is made as before.) How many see clearly that some acts involve merely an actor while others involve also something besides the actor? The first are called intransitive, the second transitive. (Writes words above lists on the board.)

Who can define a transitive act? Julia, Mary, Richard, Ola, class. What now are the two kinds of acts? How would you define an intransitive act? Give me some sentences asserting transitive acts of some boy, or man, or dog. Some sentences asserting intransitive acts. (*Note.*—If the recitation period is long enough, the classification of verbs as transitive or intransitive may follow immediately, based upon easy sentences in the text or on the board. Otherwise this topic may be taken up at the next recitation. The conception of what is meant by action must be made very broad to cover mental acts, as well as owning and owing, etc.)

Assignment.—Write to hand in ten sentences expressing transitive acts and ten expressing intransitive acts. Underline the words expressing these acts. See if you can make a good definition of a transitive verb.

Lesson II. Deductive

Special Aim.—To test the pupils' understanding of transitive verbs by applying their definitions to fairly difficult examples.

Basis Assumed.—Thorough mastery of definition of transitive verb worked out by induction; understanding of the object of a transitive verb.

Preparation.—Review of definitions. Rapid oral classification of easy verbs in:

1. The children found a lame puppy.
2. He walked to town.
3. Nobody saw the culprit.
4. Still water runs deep.
5. We planted sweet peas in March.
6. The new boy sits at our table.
7. Helen set the table for six.

Presentation.—Sentences on the board with verbs underlined (previously assigned for study).

1. Nobody *saw* him come in.
2. They *passed* the house several times.
3. He *went* home at five o'clock.
4. My hat *became* a nuisance in the wind.
5. My hat *became* my sister very well.
6. The children soon *grew* restless.
7. The baby *grew* like a weed.
8. Tommy *grew* mushrooms in his cellar.
9. He *hurt* his hand on the broken glass.
10. He *cut* himself on the broken glass.
11. He *owes* me five dollars.
12. He *ought* to pay it.
13. He *should* pay it.
14. He *will* pay it.
15. He *shall* pay it.

Teacher: Read the sentence, name the verb, classify it as transitive or intransitive, telling why in each case. If the verb is transitive, name the actor and the other thing involved besides the actor. John, Susan, etc.

(The children make topical recitations, without further questions or repetitions of directions. Mistakes are corrected by classmates as far as possible. Free discussion is encouraged.)

Assignment.—Write to hand in ten sentences using the verbs *grow*, *become*, *pass*, *write*, and *think* first transitively and then intransitively. Underline each object.

Lesson III. Drill

Special Aim.—To make the classification of verbs as transitive and intransitive rapid and accurate.

Basis Assumed.—As above.

Preparation.—Define a transitive verb, an intransitive verb. The object.

Presentation.—Twenty sentences on the board, either easy or more difficult ones, that have been discussed before.

Teacher: Read the sentence and classify the verb, saying: "The verb—is transitive" (or intransitive)—nothing more. Julia, Sarah,

etc., very quickly. (Papers prepared by the children and brought to class, based upon this assignment: "Make or find fifteen sentences in which the verbs are just hard enough and not too hard for this class now. Be sure you know how to classify them yourself.") John, read a sentence and call on some one to classify the verb. If he does this promptly and correctly, he may read a sentence and call on some one else; if not, you have another turn, and so on.

When this begins to lag, the papers are collected and the teacher reads carefully chosen sentences, not previously assigned, to the class, who are provided with slips of paper. As each sentence is read, each pupil puts down in columns on his slip the number of the sentence, the verb, and its classification (transitive or intransitive) only. Slips are exchanged for correction, and the sentences read again with the correct classification, pupils checking mistakes. The slips are then collected.

(*Note.*—Here three different devices are suggested for one lesson. Usually, however, the drill lessons should be shorter, and should preface the introduction of a new topic.)

Assignment.—A written test (or an entirely different topic).

Lesson IV. Application, Deductive and Drill[1]

Special Aim.—To apply the knowledge of transitive verbs and of old and new conjugation to the choice between the forms of *lie* and *lay*.

Basis Assumed.—A knowledge of transitive and intransitive, and of the principal parts of the two verbs.

Preparation.—Give me the principal parts of *lie*, of *lay*. Give all the forms of each. Which has no *d* anywhere? Which is transitive? Why are these two verbs more confusing than any others in the language? (Because the past tense of *lie* is the same as the present tense of *lay*—except the form *lays*.) What does each verb mean?

Presentation.—Fifteen or twenty sentences, on the board or on papers, or in the text, requiring forms of *lie* to fill blanks —including the present participle in various uses. *Teacher:* Read the sentence, filling the blank correctly. Then give all

[1] It will be noticed that the movement of this series of four lessons is largely inductive up to the understanding and definition of transitive and intransitive verbs, and largely deductive afterward.

the parts—*lie, lies, lying, lay, lain*—each time. (Fifteen or twenty sentences requiring forms of *lay*.) *Teacher:* Read the sentence, filling the blank correctly, and give all the parts. Show why the verb is transitive. (Fifteen or twenty sentences requiring a choice from forms of *lie* or *lay*.) *Teacher:* Read the sentence correctly and justify your choice. *Teacher:* Give me now a synopsis of *lie* in the third person singular, adding an appropriate phrase of place. Give a synopsis of *lay* in the third person singular, using an appropriate object (*e. g.*, I lay the carpet, etc.).

Teacher: Answer my statement with a corresponding one for the other verb. "I laid the carpet."

Pupil: I lay on the grass.

Teacher: I was laying the carpet.

Pupil: I was lying on the grass, etc., etc.

Assignment.—Write to read in class twenty sensible and not too short sentences, using forms of *lie* and *lay*. Be ready to analyze each. Use especially *lying, laying,* and *lain.*

(*c*). *Use of Analysis and Diagramming.*—A discussion of grammar methods would be incomplete without some consideration of various kinds of analysis and diagramming. Any form of analysis is good that emphasizes the principal facts about a sentence, and that insures a logical order of thinking them out. Any form of analysis is bad that calls attention to the form itself, away from the facts about the sentence. Both oral and written analysis should be used. The complete, coherent analysis of a sentence, either orally or in a written paragraph, may be made an admirable exercise in composition. Such clear statement in connected English sentences should never be crowded out by shorthand forms or diagrams; yet it is not invariably necessary or desirable. A quick and certain grasp of the essential elements of the sentence is the most important attainment for the children; and therefore they should have much rapid drill in finding these without regard to anything else. In many sentences only one or two grammatical relations are of interest, and the rest may

be taken for granted. As has been already remarked, co-ordination and subordination of members should be drilled upon until either is quickly recognized.

A Code.—Some code for numbering essential elements and underlining (or overlining) modifiers may be devised for rapid shorthand analysis. The tabular form originated by Sir Joshua Fitch[1] is familiar to most teachers. Two specimens of these quick forms are given below, the first suitable for long sentences with clause and phrase adjuncts; the second (Fitch's), most useful for shorter sentences. These forms differ from diagramming in being less mechanical and in keeping the words in their natural order, and the first is especially useful in exhibiting to the eye the relation of clauses and phrases.

1 *a*~~~~~~~~~~~~~~~~~~*a* 2 3

1. The stone which the builders rejected has become the headstone of the corner.

1~~~~~~~~1

1 2 and 3 4 1 2 3

2. A wise son maketh a glad father; but a foolish son is the heaviness of his mother.

1~~~~~~~~1

*a*_____*a*

b~~~~~~~~*b* 3 2 1

3. If the light that is in thee be darkness, how great is that darkness!

KEY TO SYMBOLS

———	= adverb.	1	= subject.
~~	= adjective.	2 and 3	= simple predicate.
line below	= phrase.	4	= object.
line above	= clause.		

1. Peter.....subj. of 3.
2. the tailor.....appos. of 1.
3. lent.....pred. vb. of 1.
4. them.....ind. obj. of 3.
5. his.....poss. mod. of 6.
6. boat.....obj. of 3.

[1] See Bibliography.

A
1. A boy's.....poss. mod. of 2.
2. will.....subj. of 3 and 5.
3. is.....cop.; joins 5 to 2.
4. the wind's.....poss. mod. of 5.
5. will.....pred. noun of 1.

6. and.....co-or. conj.; joins A and B.

B
7. the thoughts.....subj. of 9 and 12.
8. of youth.....prep. phr. ad. of 7.
9. are.....cop.; joins 12 to 7.
10. long.....adj. ad. of 12.
11. long.....adj. ad. of 12.
12. thoughts.....pred. noun of 7.

A and B.....co-or. propositions.

The forms of diagramming are too numerous and too familiar to be illustrated here. If diagramming is used at all, it should be some very simple system that cannot become a mere exercise in drawing; and it should never drive out other methods of analysis.

(*d*). *The Use of Definitions.*—The place of definitions in the teaching of grammar is an important one. In this day it is probably unnecessary to remark that definitions should not be memorized if they are not understood. It may not be so unnecessary to insist that definitions *should be* memorized when they *are* understood. Moreover a definition should be as accurate and at the same time as simple as the facts permit. An untrue definition vitiates the whole understanding of the fact; and if the pupil is not prepared to grasp a true definition he is not prepared to study the subject under discussion. The old practice of teaching, for example, somewhere about the fourth grade, that "a verb is an action word" is fortunately no longer prevalent. A definition should be, what the word implies, a true boundary between classes. It should be the summing up of the pupil's knowledge, inductively developed.

Seventh and eighth grade pupils are old enough to appreciate the wording of a clear definition and to attempt such clear definitions of their own. They may be asked to define a chair, a wagon, and other well-known objects, so that they

may discover the two things to be accomplished in defining —classification and differentiation. They may criticise definitions of familiar things, made purposely defective in classification or in differentiation. Such training helps them to learn understandingly necessary definitions both in grammar and in other subjects, and is one of the most helpful contributions of grammar to the general thinking ability of the pupils.

The definition once learned should be kept ready in mind by constant drill, and should be used as a touchstone for trying new facts. Of course it is perfectly evident that the child with a quick memory may glibly recite words that are to him mere syllables, and that no value should be attached to such parrot-talk. But the skilful teacher will make the definition useful as a test of insight, a summary of observed facts, and a key to the right classification and use of further facts.

5. Nomenclature.—The vexed subject of grammatical nomenclature cannot be adequately discussed within the limits set for this chapter. Every teacher of grammar should procure the bulletin of the National Education Association for July, 1913, which contains the report of the joint committee on grammatical nomenclature from the National Education Association, the Modern Language Association, and the American Philological Association, indorsed by the committee from the National Council of Teachers of English. While the report may seem to grade teachers extremely complicated, it is to be remembered that only such terms as are required are to be used;[1] that is, whatever *is* taught may be taught in terms that are uniform everywhere. The report, moreover, is not presented as final, and is especially recommended to the criticism of teachers in the elementary schools. It is to be remarked that these teachers were not directly represented on the committees; and that, although this movement for uniformity may not touch them in any prac-

[1] See the recommendation in the Minnesota Bulletin No. 51, also the Iowa report on needed eliminations.

tical way until publishers and superintendents begin to act upon the recommendations of the committee, nevertheless the movement does concern them, and should enlist their intelligent criticism in its experimental stage.

It has been suggested that if grammar is to be taught in the elementary school the course of study must be planned (1) to emphasize the essentials for understanding; (2) to correlate very closely with practical language and composition work. Then this subject-matter must be taught in such a way as to insure logical thinking about it, and to contribute as directly as possible to correct and effective use of the English language. For the fortunate few who master their native tongue unconsciously through daily imitation of good English, no such scientific knowledge is needed to bolster up their practice. They may get from elementary English grammar some insight into the laws of language and some helpful data for future study. But for most children in the grades, the science of grammar should be not theoretic but applied; and to this end it should be—what there is of it—truly scientific; not wide but deep.

SUMMARY

1. The traditional reasons for teaching grammar in the elementary school are no longer sufficient to keep it there; the two most important of these—that it trains in logical thinking and that it contributes to correct use of English—have been challenged by recent experimenters. Hence all teachers of English in the grades should test the practical application of grammar to the oral and written speech of their pupils, and should not be satisfied with mechanically following a text-book.
2. The course of study should provide for thorough drill on a few troublesome forms in each grade; for constant application of grammatical knowledge in composition work; for emphasis of only those facts of sentence structure and word forms that can be made to contribute to correct and effective speech.
3. In the upper grades grammatical facts should be presented in a logical order from basic facts to those that rest upon them; but they should never be divorced from use.

4. The subject-matter to be included should be determined partly by the kinds of mistakes made by children, and partly by the possible application of a given grammatical notion to the improvement of their resources of expression.
5. The chief requisites for successful teaching of grammar are a sensible plan of campaign and the thorough equipment of the teacher.
6. The aim in the teaching of grammar is to supplement drill in good habits with a knowledge of reasons, and to give a ready recognition of the relations of words. The point of view is always that language is the expression of thought.
7. The chief motive of the children should be an increasing sense of mastery over their native tongue, as they are made to feel increasingly the need of such mastery.
8. The teacher should have not Method but methods, being resourceful in the adaptation of means to ends. In developing a new point induction should generally be used; in testing and applying the new knowledge deduction is generally necessary.
9. The most important general principle of grammar-teaching is that the pupils must be made to think.
10. Analysis and diagramming may be made useful if they are simple in form, and applied to sentences such as the pupils themselves may speak or write. Analysis that shows co-ordination and subordination of sentence elements is especially valuable, if not carried out in great detail.
11. Definitions should be accurate and concise; summaries of facts learned, and touchstones for questionable usage.
12. The pupils should be specifically taught how to define, and should be led to classify and differentiate for themselves both in grammar and in other fields.
13. The vexed question of grammatical nomenclature is not yet settled; and every teacher should be informed as to the recent discussion and decisions with regard to this matter.

PROJECTS IN APPLICATION

1. Examine two texts in grammar intended for the grades, and compare them in plan, method of development, definitions, terminology, variety of exercises, and specific application of grammatical facts to good usage and to composition work.
2. Take some concise manual of good form in English composition, such as Woolley's "Handbook," and check every rule for sentence structure, usage, punctuation, or spelling that is based on gram-

matical knowledge. Which of the above rules are important for children in the grades? Which are often broken by them?

3. Make an outline for seventh or eighth year English work, showing the proportions of grammar and composition work, the subject-matter to be covered, and the correlation of the two kinds of material. If Latin, French, or German is to be introduced in the upper grades, as it is coming to be in many places, what additional facts about the grammar of English should be emphasized, if any?
4. Suggest six different exercises for impressing children in different grades with one matter of good form; *e. g.*, the use of a period at the end of a declarative or an imperative sentence. These exercises may include games or any device suited to the kind of mistake to be corrected.
5. Plan three lessons on the distinction between the past tense and the past participle of some verbs often misused, stating the grade or grades where these lessons are to be taught.
6. Review Doctor Briggs's study in the *Teachers College Record*. Do you agree with his conclusions?

TWO TABLES FROM MR. CHARTERS' STUDY OF GRAMMATICAL ERRORS[1]

Made by Kansas City Children, Grades I to VII

TABLE J

RULES TO COVER ALL TABULATED ERRORS

1. The subject of a verb is in the nominative case.

2. A substantive standing in the predicate, but describing or defining the subject, agrees with the subject in case, and is called a predicate nominative.

3. The object of a verb is in the objective case. The substantive which follows a preposition is called its object and is in the objective case.

4. (*a*) Most nouns form their plural by adding *s* or *es* to the singular. Nouns ending in *y* preceded by a consonant change *y* to *i* and add *es* to form the plural.

[1] See also the section on this subject in the "Second Report of the Committee on Elimination of Subject Matter—The Positive Program," printed by the Iowa State Teachers' Association, Professor G. M. Wilson, Ames, Iowa, chairman and distributor, also Professor Charters' suggested course based on children's errors, Sixteenth Year-Book of the National Society for the Study of Education, Public School Publishing Co., Bloomington, Ill.

The words *half*, *wife*, *knife*, *life*, and a few others change *f* to *v* before adding the suffix *s* or *es*.

A few nouns form their plural in *en*.

A few nouns form their plural by a change of vowel.

A few nouns have the same form for singular and plural.

The possessive case of most singular nouns is formed by adding *'s* to the nominative.

The feminine gender is often indicated by the ending *ess*. (Frequently when the masculine form ends in *or* or *er*, the feminine ends in *ress*.)

Gender is sometimes indicated by the ending *man*, *woman*, *maid*, *boy*, or *girl*.

(*b*) Person is that form of a pronoun which shows whether it refers to the person speaking, the person addressed, or the person (or thing) spoken of. Thus, there are three persons. Pronouns, also, have number—singular and plural, the singular referring to one person (as *I*) and the plural referring to that one person jointly with one or more other persons (as *we*—I and one or more other persons).

There is no change of form to denote the gender of the person speaking or the person spoken to, but there are forms to represent the difference in gender in the person or thing spoken of: *he* (if masculine gender), *she* (if feminine), and *it* (if lower animal or inanimate object). The plural of all genders of the third person is *they*.

For case of pronouns, see 1, 2, and 3 under this table.

The compound personal pronouns are formed (*a*) in the first person by adding *self* to the possessive singular, *selves* to the possessive plural, (*b*) in the second person as in the first.

(*c*) In the third by adding *self* to the objective singular, *selves* to the objective plural.

These forms are to be used only after the occurrence of the corresponding personal pronouns (*e. g.*: "You yourself must go." "He hurt himself").

The relative pronoun *who*, like the personal pronouns, has different forms for the different cases. Their use is like that of substantives. (See Table J, 1, 2, 3.)

Of the relative pronouns, *who* refers to persons, *which* to animals and inanimate objects. *That* may have any antecedent. *What* takes the place of both antecedent and relative.

5. In a series of nouns and pronouns the pronoun of the first person always stands last.

6. A pronoun must agree with its noun in gender, number, and person.

7. The demonstratives are *this*, plural *these*, and *that*, plural *those*.

They may be used as adjectives or as pronouns. The personal pronoun *them* is not used as an adjective.

8. A verb must agree with its subject in number and person. If, in a compound subject, the substantives connected by *or* or *nor* differ in number or person the verb usually agrees with the nearer.

9, 10, 11. Verbs have forms of tense to indicate present, past, or future time.

Weak verbs form the past by adding *ed*, *d*, or *t* to the present, sometimes with change of vowel. Strong verbs form the past by changing the vowel of the present without an additional ending.

The future tense is a verb phrase consisting of the auxiliary verbs *shall* or *will* followed by the infinitive without *to*. The past participle is that part of the verb form which is used after *I have* to form the perfect tense.

Ought is a finite verb, not a participle and, therefore, cannot be used with *have* (*had*) to form compound tenses.

12. Some verbs may be followed by a substantive denoting that which receives the action or is produced by it. These are called transitive verbs. All others are intransitive.

Some transitive verbs take a secondary object denoting the person or thing toward whom or toward which the action of the verb is directed.

May indicates permission, possibility, wish. *Can* indicates ability.

In the first person *shall*, in the second and third *will*, indicates simple futurity.

In the first person *will*, in the second and third *shall*, denote a promise, threat, consent, or resolve, the volition always being that of the speaker.

Should and *would* follow the same rules in use as do *shall* and *will*.

13. Subjunctive forms are used in wishes, prayers, conditions, and concessions. They are rare except in the copula *be*.

14. Double comparison is common in older English but now it is a gross error.

The comparative degree of an adjective is usually formed by adding *er* to the positive. There are a few irregular forms.

The superlative is usually formed by adding *est*. There are a few irregular forms.

Many adjectives of two syllables, and most adjectives of three or more syllables, are compared by the use of *more* and *most*.

15. The comparative and not the superlative is used in comparing two persons or things.

The superlative is used to compare one person or thing with two or more others.

16. An adjective is a word which modifies a substantive. An adverb is a word which modifies a verb, adjective, or adverb.

17. Modifiers should be placed as near as possible to the word or words they limit. No modifier should be inserted between *to* and its infinitive.

18. Two negatives contradict each other and make an affirmative.

19. Prepositions, also conjunctions, show various distinctions in use and meaning which must be learned by practice and the study of synonyms.

20. Unnecessary words, after the meaning is made clear, should be avoided.

21. Many words though pronounced alike have different functions to perform. The spelling usually varies according to the function.

22. The end of a declarative and very often of an imperative sentence is marked by a period.

23. The end of a direct question is marked by an interrogation-point.

24. The possessive case of most singular nouns has *'s*. Plural nouns ending in *s* add an apostrophe to denote possession. Plural nouns not ending in *s* take *'s*.

25 and 26. A sentence must contain subject and predicate.

27. A sentence is the expression of a complete thought.

Capitalization

1. Every sentence begins with a capital letter.

2. Proper nouns and adjectives derived therefrom begin with capital letters.

The rules listed in Table J are broken by the children and should, therefore, from the point of view of this study, constitute the core of the course of study in grammar. But if these rules constitute the whole course the pupils cannot understand them without learning the meaning of subject and predicate, noun, pronoun, etc., which are themselves rules or definitions of grammar. Hence, the course of study must include not only the rules broken, but in addition thereto the rules and definitions necessary for an understanding of the broken rules. The complete list is worked out in Table K.

Note by Editor: The assumption underlying this selection must be kept clear, that pupils will *use* such principles even if they *do* know them. Grammar is to be used as a tool to help children to correct speech. We have yet to discover the relative place of habit and of principles in such usage. It is safe to teach composition and use grammar only when needed.

TABLE K

AN ANALYSIS OF THE GRAMMATICAL FACTS NEEDED TO UNDERSTAND THE RULES LISTED IN TABLE J

The rules are indicated by the numbers used in Table J, rule 1.

Rule 1. Rule 1 involves a knowledge of subject and predicate and, therefore, of the sentence. Subject involves a knowledge of noun and pronoun. Nominative case includes case and nominative case in pronouns. Predicate involves the use of the verb.

Rule 2. This rule involves the copula, the expletive, and the predicate nominative as new facts.

Rule 3. (1) The new elements in this rule are the object, objective case, and the transitive verb.

(2) The preposition is introduced in 3 (2).

Rule 4. (1) In rule 4 (*a*) are introduced number in nouns, gender in nouns, and the possessive case in nouns.

(2) In rule 4 (*b*) is added case, person, gender, and number in personal pronouns, the compound personal pronoun, case of relative pronouns, gender of relative pronouns, use of *which* and uses of *what*.

Rule 5. Rule 5 introduces the conjunction.

Rule 6. No new element is added.

Rule 7. The new facts introduced are demonstrative adjectives and demonstrative pronouns.

Rule 8. (1) Rule 8 (*a*) involves two new elements—person in verbs and number in verbs.

(2) Rule 8 (*b*) adds the compound subject.

Rule 9. The new facts included in the rules given under 9 are strong verbs, weak verbs, present tense, and past tense.

Rule 10. Here is introduced the past participle, the perfect tense of the active voice, and all the tenses of the passive voice.

Rule 11. No new elements are added in rule 11.

Rule 12. Rule 12 needs three new facts—the intransitive verb, the direct object (as such), and the indirect object. The auxiliaries *can* and *may* are introduced. Other new facts needed to understand rule 12 are the future tense, *shall* and *will*, as auxiliaries and *should* and *would*.

Rule 13. This rule implies a knowledge of the subjunctive mood in the copula *be*.

Rule 14. The supplementary facts needed in these rules are comparison of adjectives.

Rule 15. No new element is needed.

Rule 16. The new facts introduced in rule 18 are the adverb and the comparison of adverbs.

Rule 17. (*a*) No new element is needed. (*b*) The infinitive is here used.

Rule 18. Introduces the double negative.

Rule 19. In rule 19 no rule not already mentioned is needed.

Rule 20. No new fact is needed in rule 20.

Rule 21. No new grammatical fact is introduced.

Rule 22. Rule 22 introduces the declarative and the imperative sentence.

Rule 23. This rule introduces the interrogative sentence.

Rule 24. No new element is added.

Rule 25. No new element is added.

Rule 26. No new element is added.

Rule 27. Rule 27 introduces the dependent clause and the independent clause (as such).

Capitalization, rule 1 involves nothing new.

Capitalization, rule 2 involves a knowledge of proper nouns, of common nouns, and of proper adjectives.

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CHAPTER VII

READING IN THE LOWER GRADES

Preliminary Problems

1. How and when did you learn to read?
2. When does reading become a social factor in a child's life? Do people use oral or silent reading most in every-day life? Why do we emphasize oral reading in school?
3. What elements make a story or poem a child's favorite? What influence should this have on primary reading?
4. How may the memory of a story or poem help early reading? How may it hinder?
5. How may pointing to words develop a slow rate of reading? How may pointing be used helpfully?
6. Can you justify a teacher in telling a child unknown words in a reading lesson? Under what conditions?
7. According to what principles should teachers select words for drills?
8. Name several ways in which dramatization may react upon reading.
9. What study habits may the child gain from his primary reading and its accompanying seat work?
10. Do you know how any particular child learned to read at home largely as play and stimulated principally by the desire to read stories? If so, how was it done?

Persisting Problems.—The joy of a little child when he finds that he can read is a force which the teacher needs to appreciate. If she can keep this joy alive from the time when he first triumphs in his recognition of a few words until he leaves the fourth grade with the ability to read and enjoy the simple material adapted to his age, she will have done much for her pupil. "What has been the hardest thing about learning to read?" was asked of a fifth-grade boy who was just beginning to show some self-confidence in his reading, and whose work in the first grade had been satisfactory.

"Well, you see my second-grade teacher used to say things, and I've always been afraid, when I've tried to read, that my teacher would say things." Many tragedies of sensitive children would be averted, interest would be aroused, and efforts renewed, if, when the teacher began to "say things," she would seek to arouse joy in the stories read, and joy in each triumph shown in mastering the difficulties in the process.

Primary teachers have developed great skill in the initial attack upon reading; teachers of beginners realize the need for careful study of their problems [7 : 64–70]. Teachers of second, third, and fourth grades have a much richer opportunity in this field than they are aware of. In many instances their problems are the same as those of the teachers of beginners, differing in degree rather than in kind, but the added ability and maturity of the pupils open new possibilities for the reading recitation.

In general, the teaching of reading divides itself into problems of thought and problems of form. The skilful teacher helps her pupils to keep the thought in mind, to develop and enjoy it, while at the same time she is guiding them in the mastery of the words and word groups which convey the thought. Perhaps the safest single direction to give an inexperienced teacher is to keep trying in various ways to teach the children to read, and to repeat those ways which work best. There are many ways of accomplishing good results.

Types of Readers.—The reading-books which the children use determine in large measure the results which may be obtained, but a good teacher will find ways of supplementing poor material, and a poor teacher will fail to get possible values from the best books. Three types of readers are in use in our schools to-day; each has its advantages and its dangers.

Certain readers contain a definite method of teaching reading. Lists of words and phonic elements are carefully worked out, and the reading lessons are based upon these

lists. The definiteness of this plan appeals to many teachers. Successfully used, such readers make the pupils independent in their reading. A poor teacher cannot use them successfully, however. The grave danger is that pupils will become mere word-callers, that little thinking will be done, and that results secured in expression will be poor.

Another group of readers use repetition stories for all early work. These readers arouse interest, give children much to think about, and lend themselves to expressive reading. They give splendid opportunity for work with phrase groups, and for learning words through context. The great danger is that teachers will not train pupils to become independent in their reading; memory of the story often hides ignorance of words. Persistent effort will secure excellent results, however, and charming childlike interpretation will follow.

A third group of readers present a variety of material, much of it based upon children's own experiences; poems and stories are mingled with accounts of real children and their various activities. Children read these accounts with a high degree of understanding, and with very natural expression. The variety of subject keeps interest keen. Vocabulary and sentence structure are likely to be simple and childlike. The dangers are that there may be a lack of literary quality, and that the pupil may not be led to think beyond his own experiences. Pupils are likely to become independent readers in using these books.

The teacher needs to supplement any reader in all possible ways—by getting her school board to buy supplementary readers, by co-operating with libraries, by having pupils bring books and papers from home, by having older pupils rewrite stories for younger ones, by her own blackboard lessons [6 : 260–300; 10 : 36–80].

Getting Acquainted with the Text.—The reader used as a basic text is to be a source of inspiration and joyful activity for the children. The teacher needs to know the text in order

to plan her lessons intelligently. She should read it through first as a whole, thinking of the interests and activities of the children as she reads, planning special lessons for special occasions, perhaps, but mainly getting the atmosphere of the stories and poems. Some lessons will suggest the flowers and fruits, birds and bees, which mark the passing seasons. So the teacher will plan to have her children observe and talk about these beauties of nature. Other lessons deal with dolls and carts, suggesting a doll day or a parade. Others are related to circus day or Christmas. The stories will arouse the dramatic instinct, the poems will appeal to the love of rhyme and rhythm. So the teacher plans as she gives this first rapid reading, but the detailed plans for individual lessons are of slower growth. In some books there may be lessons which the wise teacher will omit, realizing that they are not worth reading.

Planning to Complete the Text.—A term's work or a year's work may be represented by the text. The teacher may well have in mind from the first the amount which she will try to cover in the first month, the second, and so on. At the beginning of the year the children work slowly; they need much easy supplementary reading; blackboard lessons will be especially helpful. Yet even here they must not be allowed to drag, ways must be discovered to cover ground enough so that the children will know that they are progressing.

During the middle of the term progress is steady. There are discouraging days, but the teacher must steadily forge ahead, requiring persistent work by the children. The rereading of the easier stories during this period will help the children to gain in fluency, and will lead the teacher to appreciate their accomplishment.

By the last month of the term a dangerous fluency may have been acquired, unless the teacher is watchful to give the children new ways of attacking the lessons; then the more fluent reading becomes a great aid. Some teachers reserve certain lessons in the basic reader for this last month, so that

Various phases of an experiment in motivated learning to read at Teachers College, Columbia University, New York

Printing labels for toy houses, stores, and other objects of the classroom. Courtesy of Professor Annie E. Moore

there shall be fresh material even to the end. This is probably better planning than hurrying through the text and spending all the last month in review, though there will be much review during the year.

Securing Variety of Motive.—The energy of a pupil's attack upon his reading lesson depends largely upon the value which he believes it possesses for him. In order to keep his interest alive so that he is ready to expend a high degree of energy in accomplishing his work, a variety of motives must be presented for his reading from day to day. He reads so that he may *act*, may express by pantomime or dramatization the author's thought. He reads so that he may *enjoy* the story or poem, the teacher often measuring his enjoyment by his expressive reading or by the lighting up of his face. He reads in order to *recall experience* or to *learn* from the experience of others. He reads at times for the purpose of *sharing* with others the delights of his book, reading to an audience at home or at school the lesson which he has mastered. Again he reads in order to *illustrate* by drawings the author's thought, to *sing* the musical poem. He reads frequently for the sense of *mastery*, of *power*, which links him with all educated people. It is a splendid thing to be able to read, and emphasis needs to be laid upon the power which it brings.

The teacher may not be able to determine which of these motives is impelling the pupil to master his reading, but she can determine the motive which her questions and suggestions will seek to arouse. Time spent by the teacher in studying the motive for a lesson or series of lessons is exceptionally well spent; the alert, attentive work of the pupils as they press forward under the stimulus of an appealing motive proves this. The pupils expend their energy in search for something worth while for them; they do not need to be driven to work.

Training in Organizing Ideas.—The use which a pupil makes of the ideas presented to him in his reading determines the value to him of his reading. Many ideas occurring in

his lessons are very clear to him, relating themselves to his every-day life—home, playtime, holidays, the beautiful nature world about him. Other ideas are new to him, and the teacher knows they need careful explanation. Many ideas which are so common that the teacher supposes they are understood, prove to be stumbling-blocks, however. It is impossible for intelligent reading to be done unless the pupils have clear ideas of the conditions of which they are reading.

One of the best means for clarifying ideas is to organize them, to find their relations to one another. In a reading lesson this needs to be done by working more with the related experiences in the text than with the outside experiences of the pupils, enough of the latter being discussed to help in interpretation.

In real life certain things, certain events, naturally go together. In a reading lesson these natural relationships are found and help in organizing the material. Even the simple lessons of our primers show this, and first-grade children can discover the related ideas, can suggest the ideas they will look for. A dainty picture in one of our primers shows three little girls standing about a tiny table at which several dolls are seated. One girl has a large doll in her arms, a second girl holds three small dolls. The picture itself suggests a party. The question naturally comes: "Who is having this party?" The first sentence answers it: "I am having a party." Another question follows: "Who are the other little girls?" A search through the page discovers the names Alice and Helen. "How can we tell which is Alice and which is Helen?" Again the text tells: "Alice has three little dolls. Helen has one big doll." The invitation, the food, the games played, are all discussed, and in this way the entire reading lesson is covered. Not a sentence is read except in response to some question arising from the central idea—the party. No attempt is made to have the sentences read in sequence, the sentences describing Alice and Helen being near the bottom of the page, yet being read almost at first. A second

reading of the lesson in sequence follows as the period closes.

Put together those ideas which belong together. Train pupils to do this. Help them to find natural divisions in the story, to read together those sentences which belong together. Teach children to find a sentence which tells an important fact, or suggests surprise or suspense, then to read all those sentences which lead up to or grow out of such a sentence.

Varying Importance of Parts.—Some characters, pictures, or events in a story stand out as essential, the others are details which serve as a background. Discussion should generally centre upon the essentials, these parts should be dwelt upon far more than the relatively unimportant. Children may be asked to name or list the important characters, those of less importance; to draw a picture of an important scene; to dramatize one of the most interesting parts. In working for expressive reading, sentences or paragraphs in which surprise, suspense, or climax appear should receive the most attention.

It is not uncommon for a teacher in planning a reading lesson to look for probable difficulties, perhaps expecting to spend a greater proportion of time upon a paragraph which bristles with hard words. Her attention would better be given to those parts which have the most influence upon the spirit of the story, which give color and character to the whole [11 : 82–84].

What Pupils May Do with a Lesson.—The cut-and-dried reading lesson is gradually disappearing as new types of lessons are evolved. There are times when the choice of treatment of the entire lesson may be left to the class. Shall we read this lesson silently or dramatize it? What would you like to do during the reading period to-day? Such choice means that the pupils have had experience with different types of lessons, so that their choice is made intelligently.

Again a lesson may be assigned to a group of pupils to plan and give to the class in any way they may choose. The greater the variety of treatment when the teacher is direct-

ing the class, the more versatile the groups will be when this responsibility is given them. They should be held to earnest effort in pleasing their audience.

When pupils are given opportunity to bring from home and read to the class such reading material as they believe the class will enjoy, provision is made for much exercise of initiative. Here, too, pupils need to be required to prepare carefully the stories which they present.

In every reading lesson of any type pupils should be encouraged to ask questions and pass judgment without waiting for prompting by the teacher. Guidance will be needed to prevent disorder, and at first to help in framing worthy questions. A skilful teacher will soon provide for these, however, and will be surprised at the intelligent response which pupils will make when the way is opened.

Utilizing Pupils' Experiences.—The better the teacher understands her pupils, the more opportunities she will find for relating the reading material to their interests, for helping them to find comradeship in the lessons. This lesson fits some children especially, another suits a different group a little better. This one appeals to children's sense of humor, that to their sympathy, a third to their love of family and playmates. At times the experience of one member of a class illuminates a point for all of the others, again the lesson fits a common experience.

When once the riches of a story have been opened up for the class, the story should be referred to by the teacher from time to time, the characters and events should become thought currency with an abiding value.

The Reading Vocabulary.—During the first months, the growth of the reading vocabulary is slow, but in the second half of the first year more rapid mastery is gained, and in the second and third years comes still more rapid progress. Fourth-grade pupils should have a large reading vocabulary, though there will still be need for much sensible work in word mastery. The teacher needs to select with care those words

and word groups for which she will hold the class responsible, those for which the stronger pupils only will be held, and those which she will tell. Pupils must gain in independence, yet they must not be kept at work on uninteresting material because they lack in technical word mastery. Fresh material and new types of drill will help in gaining independence. Emphasis upon the words and word groups which a child knows, praise for the gains made, will prove a stimulus to renewed effort [11 : 4–6, 52–56].

Reaching Words Through Context.—Recognition of words during the thinking process of reading in such a way as to have them contribute to that thinking, is a necessity if reading is to be intelligent. It is therefore necessary to give training in the use of the context thought as an aid in word recognition. In all reading there is a reaching forward, an expecting in the thinking process. Training a child to make use of this expectancy in thinking out a new word, is training in getting a word through the context. What do you expect the story to say? Where do you think the hen hid her nest? What would the boys do in the garden? Such questions help to carry the thought forward and suggest the needed word. At times a pupil reads into the text a synonym for the word in the text. This is an evidence that he is thinking as he reads and seldom needs correction [11 : 156–158· 6 : 348–351].

Presentation of New Words.—Many words may be taught most quickly by thoughtful use of the lesson as it occurs on the page. A picture of children carrying an umbrella suggests not only the words *children* and *umbrella*, but *rain* and *storm* also. These ideas are all familiar ones, the picture forms a connecting-link, all that is necessary is for the pupils to find the words on the page. The very fact that the children have these words in mind helps them in their search. Whatever knowledge of phonics they have, helps in this word recognition.

Some words are most economically drilled upon in pairs

or in groups. No word should be taught which does not relate to some experience of the children. Contrast is one of the strongest factors to use in teaching words, so lists of opposites may well be used for drill:

yes	boy	father	up	sleep	come	little	good	fast
no	girl	mother	down	wake	go	big	bad	slow

It is economy also to teach together words which stand for related ideas: mother, baby, love, sing; egg, nest, bird, tree; seed, plant, garden. Another advantage is gained by teaching as units those word groups which most frequently occur: good morning, good-by; a little girl (boy, kitten); in the house (garden, tree); there is; once upon a time.

There was a time when the teacher was supposed to weave into story form all words presented in lists. This is waste effort. The essentials are for the children to have the idea, to relate the idea to the printed word, to make the connection frequently enough so that it becomes automatic. The day's book lesson may or may not be the unit for word work. By using lists of opposites, series of related words, and common word groups, the word work will at times go more rapidly than the reading lessons.

Phonic Work.—There are three phases of phonic work: training the ear to recognize sounds; training the voice to make them; training the eye to recognize their symbols. The first two may well precede the third. Perhaps the most natural sounds for children to imitate, those which lead to the most unconscious use of the vocal organs, are the sounds made by the animals and machines with which the child is in daily contact: *buzz, buzz; cluck, cluck; chug, chug.* Later the sight words which they have learned may be grouped, and the common phonic elements taught. Work at first with initial consonants only: *s, k, t, p, m, f, r.* Later use common phonograms: *ate, est, at, an, ight, ay.*

As soon as a phonic element is taught, the pupils may

give words which begin with it. The element itself may be presented on the blackboard or on a card, the words may be given orally only. Later will come word building. Use the phonics in the reading lessons as early as possible after they are taught. Turn to a familiar story and say: "I find a word which begins with *t*." Let the children find the word and name it. Gradually make use of this knowledge in attacking new words in the reading lesson [10 : 102–123].

Other Means of Recognizing Words.—A body of knowledge is being accumulated showing how the eye recognizes words. Difference in length is one factor. Other things being equal, the eye distinguishes more rapidly between a long and a short word than between two short words: *big*, *little* present a greater contrast than *man*, *fan*. Height of letters is another factor, letters which extend above and below the line being more readily recognized than single-space letters: *little*, *pretty* have more character than *are*, *run*. The first and last parts of a word are more quickly noticed than the middle: *barn*, *wonder* have difficulties, *or* and *on*. Call attention to those features which attract the eye most readily, have patience with the difficult parts [11 : 125–135; 6 : 96–101].

Essentials of Drill.—Drills must be very short in order to hold the attention of pupils; from three to five minutes is long enough. Fatigue sets in after a very few minutes, and loss of energy results. Drills should be rapid. The eye recognizes words very rapidly, and this rapid recognition should be cultivated. The class must (1) focus attention upon the work, (2) repeat the words or phonic elements with attention, (3) give the correct response each time. In general, it is better to have individual rather than concert responses, the children answering in turn so that no time shall be wasted in calling names. When an incorrect answer is given, call upon the class for the correct answer. Get back several times to the child who makes a mistake, until the right response seems fixed. Be patient with the slow child, give him the easier words. Let children select and point to the words

which they know. Challenge the stronger pupils to name the entire list [6 : 52–60].

Motivated Reviews.—Every time that a story is reread attentively, recognition of the words is more rapid, and the reading is smoother. The motives of enjoyment, of dramatization, of sharing may suggest such rereadings. Certain texts have review pages so arranged as to recall the lessons already read, while at the same time appealing to the puzzle instinct, the rhyming instinct, the delight in voice play. Some teachers are able to plan delightful reviews of this type, using the blackboard for their presentation. The use of supplementary readers often makes it possible to read another version of a favorite story.

New Context Relationships.—The new word may be suggested by a picture, found in the text, drilled upon in the drill period, and recognized more readily in the motivated review. Each of these steps is essential. The final test, however, is the recognition of the word in new context relations. Proper gradation of the basal text and the use of simple, attractive supplementary readers will provide for this test. In selecting supplementary readers, attention must be paid to the vocabulary of each. Fortunately a number of charming readers are on the market, containing interesting stories told in childlike language, and using over and over again the fundamental words of the child's early reading vocabulary. Needed fluency and sense of power come as a class finds itself able to take set after set of these simple books and read their delightful contents. Gradually the words become, as they should, but the tools of thought, they are recognized reflexly, and the pupils become eager, independent readers.

Planning for Variety of Material.—The story, the poem, informational lessons, dramatizations are all found in the reading material—if not in the basic text, then in the supplementary readers and blackboard lessons. Exclusive use of any one kind of material is likely to produce a surfeit,

Printing labels for their houses. An experiment in reading. *Teachers College Record*, September, 1916

some child may not respond as readily to one kind as to another. The treatment of these lessons emphasizes the difference between fact and fancy, between diction which lends itself to musical reading and that which may be read silently and told, as well as read orally. Experiences of the class may be developed into reading material in the language period. Older classes may rewrite in dramatic form for younger classes some of the fine fables and fairy-stories.

Types of Lessons.—The first lesson with a new selection should frequently be a study recitation. In this the teacher helps the children to find problems for themselves, to ask questions, to discover the essential parts. Frequently the problems and questions become the assignment for the next study period, and their answers form the basis for the recitation period following. Another recitation may consist of work upon dramatic oral reading of sections best adapted for expressive reading. Informational lessons may be read silently, the class discussing the facts as they read, or each reading at his own pace and questioning the teacher as he finds it necessary [6 : 75–87].

Seat Work and Study Periods.—The pupil needs to make a companion of his book, to browse over it by himself. In some way the assignment for seat work or study needs to direct him so that he shall attack his book with some definite work to do. This may be either preparation for a class recitation, or the outgrowth of a previous recitation. Essentials should be dwelt upon, organizing ideas should be worked over; judgment, reason, fancy, humor—all should come into play. The assignment may deal with form as well as with thought, with words as well as with ideas. Whatever is given the pupil to do at his seat, care should be taken that he understands what is required. He should be trained to attack his work promptly and energetically, and in some way use should be made of his results [6 : 106–111].

Accomplishment in Lesson Periods.—The purpose of a reading lesson is for the pupils to grow in reading ability.

The teacher must see that pupils keep the place, follow the thought, help one another with difficulties of thought and form. Some questioning and discussion are necessary in order to illuminate the author's thought, to relate it to the experiences of the pupils. The lesson should not degenerate, however, into mere discussion and exchange of experience; the reading is the essential activity. Push the work with vigor, do not fuss over minor points, be certain that the main ideas are expressed clearly. It seems a miracle almost when this steady, effective work is carried on without strain, time being taken to enjoy the bits of humor or fancy; yet such a pace combined with the atmosphere of leisure is possible. The teacher to whom the lesson appeals as a literary whole will see to it that the end is reached during the lesson period, she herself or a strong pupil reading the final paragraph if time presses [11 : 106–108].

Working for Expression.—Children are naturally dramatic, every class has some who are leaders in this line. By selecting with care those parts of the reading lesson which are most fitted for dramatic expression, by getting the pupils into the spirit of such parts, by utilizing the ability of the leaders, good expression may be obtained. There should be no servile imitation, but the teacher and better pupils may set a standard. Care needs to be taken that the leaders themselves develop in their rendering. There is danger of their becoming self-satisfied. The reading of poems should receive more careful attention than is usual, the musical diction, rhyme, and rhythm all being recognized. Natural, childlike expression is all that is asked, but it should be intelligent and pleasing.

The Slow Child and the Slow Class.—Speed in reading is a desirable factor and we need to train for it. Certain children have greater difficulties than others. They frequently become discouraged and effort ceases. A class which has had poor teaching may be a puzzle to a good teacher, for it is hard to find what they know. In both cases use simple read-

ing so far as possible, call on the slow child for the easier sentences. Give much encouragement whenever a word or a sentence is mastered. The teacher may read a new lesson to the slow class, they following in their own books with eyes and fingers, she calling on them to name certain words as she progresses, or to reread paragraphs or sentences after her. Later they read the lesson for themselves. Rapid drills on common words are necessary, but should not be depended upon altogether.

Measuring Results.—Standards in rate of reading and in thought-getting are rapidly being developed. Doctor Thorndike, for example, has published a very valuable scale for measuring the progress and results in reading, and very satisfactory and practical standards will soon be perfected by experiment, adaptation, and wide use. Every teacher of reading should possess the Thorndike or other satisfactory scale, the same as she possesses and uses handwriting and spelling scales, and should learn to use it in her work. This is her opportunity to help make teaching a science and a profession instead of a rule-of-thumb trade. Moreover, present subjective standards should be utilized. The teacher needs to cultivate her judgment and appreciation of good work in reading by visiting other classes and having others criticise her work. She needs to set herself to determining whether her pupils are strong and rapid in thought-getting, reasonably charming in oral reading, independent in attacking words, happy in their growing power of accomplishment, and interested in the stories and other thought content provided for their instruction and enjoyment.

SUMMARY

1. Reading is concerned with problems of thought and problems of form.
2. The teacher needs to know her reader as a whole, both strong and weak points.
3. Reading motives should be varied in order to keep interest keen.

4. Intelligent reading is secured by discussing the thought presented in the text.
5. Reading lessons should be related to the experiences of pupils and should lead them into new lines of activity.
6. New words should generally be presented first in their context, then tested in drills, and so gradually become part of the working vocabulary.
7. Phonics should include ear, voice, and eye training.
8. The pupil needs to attack his reading lessons in different ways from day to day.
9. Assignments for study should be definite and within the student's ability.
10. Results are shown in knowledge of vocabulary, rate of reading, grasp of thought, and natural, childlike expression.

PROJECTS IN APPLICATION

1. Examine two or more primary readers, classifying by titles and pages the selections which relate to children's varied interests and activities; *e. g.*, games, seasons, holidays.
2. Classify the words and word groups on a primer page under these headings:
   (1) Words pupils should know instantly.
   (2) Words strong pupils may know.
   (3) Unknown words to be reached through context.
   (4) Unknown words to be reached through sounds.
   (5) Unknown words to be told by teacher.
3. Divide a long story from a third or fourth reader into its main parts, giving each part a fitting name which would attract a child.
4. Make note during one day of the sounds you hear made by animals, machines, and children. How could these be utilized in phonic work? In expressive reading?
5. Study several long stories in primary readers. List three or four sentences from each which need especial attention in oral reading; several from each which are most essential for the understanding of the story.
6. From the vocabulary of any primer select those words which are opposites. Which of these could be taught in relation to children's schoolroom activities?
7. Examine several primers and list the word groups which occur most frequently in each. How many of these groups are common idiomatic expressions? Could they be used as units in spelling as well as in reading?

8. Visit a popular bookstore and examine the books for children which are offered for sale. Note their literary value, hygiene of type and page, and artistic features. Visit the children's department of your public library and make the same notes. What practical means could be taken to improve the character of the books offered for sale?
9. When visiting homes in which there are primary children note the amount and suitability of the reading material at their disposal. What companionship in reading does the home afford?
10. Have pupils bring in daily from home for a week five or ten words which they know, which they have cut from newspaper headings or advertisements. Let them mount these words on cards, fourth-grade pupils first arranging theirs in alphabetical order. What effect does this seem to have on their interest in words? Why?
11. Measure several series of readers as to size of type and width of leading, and compare with the standards given in the appendix.[1]

[1] Appendix under Hygiene of Readers.

12. In visiting motion-picture productions note when and how the films provide for looking into the future, for recalling the past. How may these opportunities be made use of in a reading lesson?

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CHAPTER VIII

READING IN THE UPPER GRADES

Preliminary Problems

1. What percentage of pupils, as you know them, can be excused in fourth and later grades from reading lessons as such, thus confining themselves to such reading as is necessary to the study of other lessons? Would it be desirable to do so for any, or all?
2. If silent reading is the type of reading most used in life and if continued practice in oral reading slows up the process of silent reading, why not have most reading done silently in the upper grades?
3. If literature is not taught as a separate subject to any great extent and if history, geography, civics, hygiene, moral education, manual education, and other subjects are too lacking in emotional, literary elements for cultivating ideals and appreciations, cannot most of the desirable literature be correlated with these subjects?
4. What literary selections could be used in the upper grades to develop ideals and appreciations of (1) *citizenship* on the child's plane? See "A Course in Citizenship" by Cabot and others, for example. (Houghton Mifflin Co.)
5. What literary selections can be used to contribute ideals and enthusiasms for (2) *good health* and a fine physique, for clean sport and a clean life?
6. What selections actually do change pupils emotionally in the direction, also, of the ideals needed for (3) *vocational* efficiency in and out of the home, for (4) *avocational*, or recreational, efficiency, and for (5) *moral* efficiency?
7. Which of the five social aims of education named above and in Chapter I is most influenced by "The King of the Golden River," as read in class or otherwise? By other selections?
8. What literature have you seen that would counteract such ideals as that of "bullying" smaller boys on the playground?
9. What is the best scale for measuring ability in silent reading?
10. What success have we had in constructing an oral reading scale?

I. The Reading Problem

The problem of reading, *i. e.*, the interpretation of the page with accuracy and with reasonable speed, remains the same, irrespective of the grade or the department of the school in which the subject is taught. There is, however, a disposition on the part of many teachers, particularly in the intermediate and grammar grades, to confuse the values of reading and literature. Literature as such is not taught primarily for its habit-forming or informational values, while reading is. The fundamental purpose of beginning reading is that of training children in the facile recognition, use, and interpretation of words and sentences; later reading becomes the primary intellectual instrument for the acquisition of information. Both literature and reading have certain conventional and disciplinary values, but instruction in them is not justified wholly for these reasons. Literature, considered as the finest of the fine arts, is one of the chief sources, also, for the development of ideals; but this outcome is only incidental to reading.

How appreciation for literature can best be developed has long been one of the mooted questions in education. If one were to take current practice as the criterion, he would say that the best way to accomplish this is by a study of literary technic. Selections ranging in value from the poorest to the very best, both in poetry and in prose, are analyzed, apparently, for the exclusive purpose of giving a knowledge of literary construction. It is doubtful if literary appreciation will ever be secured by this means. Some knowledge of the technical phases of literary structure are essential to literary appreciation, but any attempt to secure this appreciation through analysis only is likely to be futile. Some selections are so delicate in structure and subtle in sentiment that it seems almost sacrilegious to subject them to literary analysis. Appreciation may be secured for any art: (1) by an analysis and understanding of its fundamental principles (this to be

secured by a study of examples perfect in structure, but of ordinary sentimental value), and (2) by placing one in an environment saturated with the best types of art, *e. g.*, the best music must be heard over and over, the most beautiful pictures must be seen again and again, and the most perfect works of literary art must be read and reread. The things one sees, hears, and reads eventually sink into his soul and become a constituent part of his character.

Oral Reading and Silent Reading.—The desire to cultivate an appreciation for good literature accounts in part for the introduction of so much supplementary material of a literary character in the intermediate and grammar grades. Complete literary selections or parts of masterpieces now constitute the bulk of the collateral material used. Such selections lend themselves to oral reading. But most of the material in the readers and in the other text-books of the school was never intended to be read aloud. It was written to convey information. Unfortunately, the practice of having practically all selections read aloud prevails in most sections of the United States. It would be far better and of much greater educative value if a teaching technic were developed for *silent* reading so that all material of a strictly informational character could be read accurately and with great speed. There is no one thing that would pay greater dividends in the economy of mental life, for it has been established that there is a direct relationship between one's retentiveness and his speed in reading. As a rule, slow readers are forgetful readers, while rapid readers are retentive readers. A direct and positive relation exists between speed and accuracy in reading when one reads with a maximum degree of concentration. Children should be taught to read as fast as they can and as accurately as they can.

Oral Reading and Its Criticism.—The traditional practice is to have selections read paragraph by paragraph, and to have the reading criticised. The criticisms are often of a most useless character, such as: "She didn't pause at the

comma," "She didn't let her voice fall at the period," "She said wuz for was," and the like. Unless these criticisms are valid, and the reader is compelled to correct his faults then and there, nothing of value is likely to result from them. But suppose a teacher were to say to a class: "Now, to-morrow I want each of you to choose for oral reading the funniest part of the story, or the most interesting part of the story, or the part which would be of the greatest value to old people. You must be able to read it to show that it is funny, or interesting, or of great worth." With such instructions as these in mind no child would think of preparing himself to read the entire selection aloud; he would omit the explanatory parts that do not lend themselves to oral reading. Will anything be lost if different children have different ideas as to what is funny, or interesting, or of great value to old people? Is not that exactly what the teacher should expect? And will it not furnish her with the only natural basis for intelligent criticisms? Now, the reading of those who have chosen the same part can be compared, or it can be contrasted with those who have chosen different parts. Criticism under such a condition would be rational, full of interest and meaning. In order to present their parts effectively the children would have an incentive for oral practice.

By the time children have reached the intermediate grades it is presumed that they have acquired a mastery of the mechanics of reading. They should now know how to read. It does not follow that they are therefore good readers. Indeed we know that constant and unremitting attention must still be given to word drills. But articulation, enunciation, and pronunciation drills now become more characteristic of class work than drills upon sight words or phonograms.

Intermediate-Grade Reading and Retardation.—Some of the recent studies on retardation seem to have a bearing upon the problem of intermediate-grade reading. These studies have established the fact that the retards are congested in the third, fourth, and fifth grades. School superintendents, recog-

nizing this fact, have been casting about to find some means of reducing the amount of retardation. Among other things that have been tried with varying success, has been the plan of introducing more reading of an informational and concrete character in these grades. Our school readers are sadly deficient in this sort of material. All pupils, and particularly boys of the intermediate-grade age, have a growing interest in material reality. They want to know how things are made. In some of the Indianapolis schools where reading material of this sort has been introduced there has been a marked decrease in the various forms of grade delinquency. Certainly this experiment is well worth trying in other schools.

The argument presented in the preceding paragraph must not be construed as an argument for omitting the better types of literature from our readers. They must be retained, but for other reasons.

II. Aids to Reading

Aids to Reading: Position.—Important as the matter of position is in reading, it can easily be overemphasized. "There is no surer way of producing all that is not wanted in a recitation than to let a class rise in the same way; use their hands, heads, legs, in the same way; smile, wink, ogle, start, plunge, stamp, snort, sniff, yawn, stare, and fool in the same way. They cease to be a class; they are a hydra-headed automaton." Neither this condition nor that where the class is given unrestricted liberty is the right point of view; it must lie somewhere in between these extremes.

The rules to be followed in securing a satisfactory position are few and simple. Children should be required to rise quickly and quietly when called upon, and to stand reasonably still. There is no excuse for weaving backward and forward, for shuffling the feet, for twisting the body, interlacing the fingers, or twiddling with pencils. An upright position should be demanded. This brings the chest forward

makes the reading easier, and gives a sort of dignity to reading not always obtained in the elementary schools.

Teachers should give special attention to the position of the book. While no absolute rule should be laid down with reference to the hand in which the book should be held, in every instance it should be held so as to secure the best light and thus avoid eye-strain. The child with normal eyes will get the best results if the book is held about eighteen inches from the eyes, and in such a position so that the light falls upon the page from the left side.

Aids to Reading: Articulation.—Intelligent oral reading and speaking are proper correctives for poor articulation and enunciation. Sloven articulation, indistinct enunciation, and slurring pronunciation, are common American vices, which the school can do much to correct. Unless the school devotes itself without ceasing to the destruction of these habits, we may expect them to spread and the people to become more and more satisfied with them. There is nothing that so quickly distinguishes culture from crudeness, good breeding from poor breeding, intelligence from ignorance, as the language one uses, and the manner in which he uses it. Language habits are a fair index of one's training and of his social station. We use "harsh, commonplace, affected, strident, feeble, fluffy, sloppy, grating, silly" voices partly because we have not been intelligently instructed and habituated in correct language habits.

Articulation, enunciation, and pronunciation drills should be regarded as fundamental and essential to proper reading. These drills are not reading; they are the preparation for reading. They should not be engaged in while one is reading. The main purpose of oral reading is to convey thought and emotion through expression. Articulation drills merely prepare and equip one to do this effectively.

These drills should usually be carried on apart from the regular reading lesson. They should be short. If two minutes a day are devoted to such drills, surprising results will

be secured. Drill is not economical if the teacher spends a large share of the class time in talking or in doing things to attract the attention of the children. She will not say: "Now, children, let me have your attention," "We are going to have a drill in articulation; I think it will be interesting." "If John will turn his face to the front and Mary will put aside her papers, we will begin," "Now answer promptly, etc., etc." This is bad; the teacher wastes half or more of the time. The class should know that this drill exercise will start promptly, that it will be short, aggressive, and systematic, and that they must give their undivided attention to it every second of the time.

The method involved in drill is the method of habit formation. The attention of the children must be focussed upon the thing drilled upon. The point of difficulty should be raised to consciousness. Mere repetition is uneconomical. The number of repetitions necessary to reduce a process to habit varies inversely with the intensity of the focalization of the attention of the children upon the part that gives difficulty. Interest in drill work increases as the devices are varied. There must, however, be constantly recurring situations. It is not sufficient merely to call the attention of the children to their mistakes, nor is it sufficient to expect when they have been drilled upon a thing until they are perfect in it that it will not be necessary for them to be drilled upon it a week later.

The material to be used in drill work in articulation and pronunciation should consist of consonant and vowel sounds, isolated words, sentences, and alliterative exercises. Very excellent material for drill along each of these lines is given in "Clear Speaking and Good Reading," by Arthur Burrell, published by Longmans, Green & Co.

Professor Burrell gives many gymnastic exercises that are of service in training the vocal mechanism. These exercises range from simple consonant and vowel sounds to difficult combinations of words.

The following illustrate some of the types suggested:

1. Ha, ha, ha, ha, he, he, he, he, ho, ho, ho, ho, ho.
2. Have, had, happen, heaven, help, hoist, hall, whole, holy, Harry.
3. Pool, tooth, moon, rule, rude, loom, room (not r͝oom), food.
4. Rye, type, like, scythe, oblige, chime, wine, sigh.
5. Rash, cattle, dazzle, landed, tackle, facts, acts, apt.
6. I have said, he is, he is not, we don't know, I saw her, I haven't, I shouldn't do it.
7. The sick stammerer, muddled heads, difficult questions. Six simple sisters sat sewing shirts. Hold your hands up high, Harry. Mrs. Fiske's fried fish sauce shop.

Any resourceful teacher can easily add to this list or make others equally as good.

In Sherman and Reed's "Essentials of Teaching Reading," published by the University Publishing Company, Lincoln, Nebraska, there is an interesting list of alliterative exercises. I have chosen five of the best ones:

1. Brother Ben boldly beat, battered, and bruised the British with his bludgeon.
2. Columbus Capricorn was cross, crabbed, crooked, carbuncled, and crusty.
3. Nancy Nimble, with a nice new needle, netted neat nets.
4. The stripling strangers strayed through the struggling stream.
5. Six brave maids sat on six broad beds, and braided broad braids.

Children delight in manufacturing such tongue-twisters as the above. There is no reason why they should not be permitted to put their ingenuity to such use.

Some may have wondered as they have read this discussion why I have not urged the use of words for drill that occur in the daily work of the children. This is exactly what I should do. Most of the exercises should be of this character. However, they should not all be; for drill upon the elements of words and alliterative terms insures a facility and tone which the mere pronunciation of more or less easy words can never produce.

Aids to Reading: the Dictionary.—The dictionary is but little, if any, more a phase of reading than it is of geography, history, or of any other content subject. Every one admits its value, but few have the habit of using it. Like the Bible, the dictionary is one of those things that are very valuable but are seldom used. Lessons in it are of a formal character. In this respect they are like lessons in pronunciation, capitalization, the use of margins, indentations, cyclopedias, gazetteers, tables of contents, and glossaries. All such lessons are not in themselves intrinsically interesting. The material used is matter-of-fact; it is not something that increases in meaning and significance as a geographical fact does. For this reason interest must be infused into recitations dealing with this type of material.

The first important lesson for children to learn in the use of the dictionary is that of finding words quickly. To accomplish this they must be able to use the alphabet forward and backward with equal facility. Time will be saved if the dictionary adopted has a thumb index. One of the devices to be taught is the use of the index words at the top of the page. These index words show what words are included on any given page. A few whole lessons should be given in which the children do nothing but locate words in the dictionary. From the fourth grade on every pupil should have a good dictionary, indexed and well printed in large type, furnished by the schools.

At the very outset children must be taught to note the alphabetical order of the word structure.

The time to teach diacritical marks is when the dictionary is introduced. The pupils can then see and appreciate their use in the pronunciation of difficult words. Two other things are involved in teaching pronunciation: one is the spelling of words, including the syllabic division and the use of the hyphen, and the other is the primary and secondary accents.

How to find a word and how to pronounce it are important for reading purposes. In the upper grades some attention

should be given to the aid the dictionary gives in the study of grammar and the etymology of words. These, however, have only a very remote relationship to reading. The dictionary serves one other purpose which contributes to better reading: it gives the meaning of words. Inasmuch as several definitions are usually given, definitions varying in shades of meaning, the pupils must be taught to discriminate between them and to choose the one that fits in with the context best. Pupils should not be permitted to repeat definitions from memory.

Note.—The various steps in the treatment of each of these problems, together with an abundance of illustrative examples, may be found in a pamphlet prepared by Professor Thomas Briggs, and published by G. & C. Merriam & Co., Springfield, Mass. This pamphlet may be had for the asking.

Assignment in Reading.—The assignment of lessons is one of the teacher's means of preparing pupils for private study. By it the teacher shows the pupils how to engage in individual drill, the manner in which they may successfully apply principles already developed, or the method to be used in treating new material. The assignment is the teacher's one best chance of stimulating children with a desire for the work that is to follow. For this reason it should be carefully and methodically given, and should be definite and clear.

The obscurity of most assignments is due to the failure of the teacher to make adequate personal preparation. Without this they are frequently nothing more than mere guesswork; each succeeding part of the text is treated in the same cut-and-dried fashion as the preceding. The teacher being unfamiliar with approaching difficulties, may by her habitually monotonous way of making assignments really interfere, if not block, the pupil's progress. Study increases in intelligence somewhat in the degree that the main or salient features of the material to be studied are emphasized in the assignments. The unprepared teacher cannot point the way to that collateral material which is necessary to illuminate

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the text. And again the teacher who has thought the new lesson through is better able to supply those stimulating hints that are essential to valuable study.

These general principles are as applicable to reading as to any other subject. If the material to be studied lends itself to oral reading, the discussion and the questions asked preceding the study should be of such a character as to call for the reading of the entire selection, and that several times. Correct and effective oral reading depends upon an understanding of the selection. Moreover, it depends upon a familiarity with the difficulties and a knowledge of the allusions found in the selection. However, it is easily possible to put so much stress upon these that effective oral practice will not be indulged in. The proper method must be somewhere between that assignment which puts all its emphasis upon words, difficult passages, and allusions, and that kind of reading which places no stress upon such matters. Intelligent oral reading depends upon intelligent practice, and this depends upon effective assignments.

Material used primarily for silent reading should be so assigned as to call for organization. The emotional element and coloring present in reading the "literature of power" is largely absent in that type of silent reading in which the school seeks to educate and train children. In adult life, to be sure, nearly all material will be read silently. The habits of silent reading and the forms of organization essential to recall growing out of it should be emphasized in the assignment of the "literature of information."

The two types of assignment are not mutually exclusive. They do, however, represent different nodal points in our thinking. By the form of the question used, and the material that appears in the assignments, the supervising critic has a fair notion of the large purpose that the teacher hopes to realize. He can tell whether the end sought is facility in intellectual organization or a taste and appreciation for the artistic aspects of literature. If the aim be some definite

changes in the pupils' ideals in the direction of the larger aims of education, then all methods and devices must be so directed.

Dramatics.—Few doubt the wisdom of continuing dramatics through the upper grades. It was pointed out in the preceding chapter that young children possess the power of concrete imagery, and that this power is easily lost. Sympathy with the forms of artistic expression can be cultivated by the revival of concrete imagery. As children mature there is danger that they will acquire the adult tendency of emphasizing the symbols of prose and poetry, and that the living images and scenes described by them will be without genuine significance. Whenever this state is reached *literary interpretation* becomes impossible. Verbal imagery, concrete imagery, and the imaginal elements are devitalized. Such subjects as geography and science are adapted by nature to the cultivation of the symbolic types of imagery; such subjects as literature and art are adapted by nature to the cultivation of the concrete types of imagery. Each of these must receive its proper emphasis in the school. Whenever literature, using the word in its highest and best sense, appeals to the eye alone the choicest pieces of poetry and prose go uninterpreted. From the earliest times literary masterpieces have been interpreted and communicated through oral and dramatic representation. Those early racial devices are still the ones, psychologically speaking, required for the most sympathetic interpretation of literature. Story-telling and dramatization, currently used in the earlier grades, should be given a wider use than they now enjoy in the later grades.

What children normally indulge in in the world is some evidence of the method that might be employed with profit in the school. Out of school they are the myth makers as well as the myth actors of the race. The cultivation of their imaginative powers through dramatic performance is one of the new obligations resting upon the present teaching force. The teacher who will not make use of the device is either in-

crusted by an unworthy tradition and conservatism, or is ignorant of its worth. It is this spirit of child life, which, when kept alive in adulthood, prolongs plasticity and efficiency.

It is true that some teachers decline to use dramatization on the ground that it will attract the attention of other children, and thus interfere with the regular work. The teachers who make this claim are usually the ones who have not given the plan a fair trial. Country teachers object more strenuously to its use than town or city teachers. This is due to the fact that they have a number of grades in one room. Those teachers who have given it a fair test assert that it does attract attention while it is new; but when the novelty has worn off, and it has come to be regarded by the school as one of the regular parts of reading or language work, it distracts others from their work no more than other interesting devices do.

Dramatization properly conducted, is simple in its nature and far-reaching in its results. It requires nothing but imagination for a girl with a pail to represent a milk maid, a boy crouching on the floor to represent a fox, or looking through the rounds of a chair to pretend that he is a wolf, or for a boy seated in a box of straw to act as if he were a dog in the manger. Any kind of animal and almost any character can be effectually imitated or represented without elaborate costumes or paraphernalia; the simple things about the school will be sufficient.

There is one fallacy of which I should like to undeceive some teachers. It is the fallacy that grammar-grade children either cannot or do not like to dramatize. In either case, if such a situation exists, it is not nearly so much a criticism upon the children as it is upon the kind of instruction they have been receiving. They should like it, and will like it if they have been taught to like it. Really the work should be far more finished and polished in character in the upper than in the lower grades. I am well acquainted with one

school where every grade dramatizes. The children are given the privilege of practising their "play" in an adjoining room, in a corner of the corridor, at the side of the building, or under the shade of some convenient tree. It may be urged that they abuse their privileges. Such a suspicion or accusation is unfounded, for these children know full well that to abuse their privileges means that they will lose them; furthermore, they know that another group is rehearsing the same scene, and that the two groups will be compared. Practice, of course, improves the product. Those teachers who can find no place to permit practice are not resourceful.

Reading of Memory Gems.—Another factor that has an indirect bearing upon reading is the committing of memory gems. We know that the number of repetitions decreases in proportion as the memorizing is done by thought units. Ordinarily the following directions can be followed safely: Understand the meaning of the selection, repeat the whole selection every time, pause and take stock at suitable divisions, and work intensively. Do not ignore the last factor. It is true that one might eventually commit a passage to memory by saying it over and over in a dilatory manner. Persistent effort counts in the long run, but it does not count nearly so much as intense effort. A combination of the two effectually insures an effective result in a minimum time.

Direction of Private Reading.—The necessity of directing the private reading of pupils should increase with their maturity. Something may be done with it in the lower grades. Every room and every school should be supplied with its own library, and the books contained in the library should be adapted to the age and attainment of the pupils. Appropriate books wisely selected have been great silent forces in modifying the discipline of many a school, and in cultivating the intellectual interests of many a boy and girl. Fathers and mothers have shared in the reading of the books. Indirectly, no doubt, the school library movement has been responsible for the enlargement of many a home library,

not to mention the enlargement of vision, experience, and ideals.

The direction of outside reading is an extra-school problem of paramount importance. Boys are likely to be attracted by racy and salacious literature, while girls are likely to be attracted by insipid love-stories. Indiscriminate and undirected reading may lead to vicious results. Wherever the home consciously assumes control of this function, the obligation resting upon the school is correspondingly lessened. But all too frequently the home is willing to shift the burden of this responsibility upon the school. To insure the reading of the right kind of books at home, the school is warranted in requiring some kind of formal report from the pupils. This may be done by setting aside a regular time in the weekly schedule for oral reports, or by having the pupils hand in synoptical statements of the books read. The former is much the better plan as it avoids cheating and stimulates others to do additional reading.

The regular reading lesson should be used frequently as a pleasure reading period, an "appreciative lesson." Pupils should be encouraged to practise upon the part they want to read. The test of their reading is found in the interest and attitude of the best of the class, who constitute a true audience. Such a plan gives an opportunity to several pupils to read parts from different books. They should read these better than they read the assignments from their texts, because the parts read will be selected on account of the personal interest the individuals have in them. A teacher will be making a good use of her time if she insists upon each pupil who wishes to read during the pleasure period, giving her a private demonstration of the skill and effectiveness with which he can read the part he has selected. Occasionally a pupil may be encouraged to tell parts of the story, reading only here and there; if this plan is followed, the pupil might be permitted to tell the story up to the dramatic point. The book should then be left in some convenient place so that those

who have been caught by the story may have an opportunity to finish it. Many teachers are helping pupils and parents to get at club rates attractive magazines for home and school reading. Every school should be the public-library centre for the community.

All private reading should be encouraged for two reasons: (1) That it may be controlled and directed until the pupils have acquired an ability to choose intelligently their own material for independent reading; (2) that the pupils may be stimulated to read much in many fields. There is an old saying that we had better be a master of one book than a master of none. The statement is true only when that one book is a good book. It is certainly better to know many books, to have a kind of cosmopolitan interest in the various fields of literary endeavor, than to spend one's time mulling over one or two books. This wider knowledge and familiarity with books the school can give.

Professor Chubb in "The Teaching of English," published by the Macmillan Co., a most admirable book for teachers, advises the elimination of three types of reading material from the grammar grades: (1) Whatever is touched with the more conscious reflective sentiment of adult love (*e. g.*, in "Enoch Arden" and in "Idylls of the King"); (2) whatever is bathed in an atmosphere of settled gloom—many of Hawthorne's stories; and (3) whatever leads to the more solemn and darker mysteries of life. He recommends that outside reading in the grammar grades consist at times (*a*) of tastable books, like "Alice in Wonderland," or Irving's "Sketch-Book," or "Alhambra," or "Knickerbocker's New York," or the "Boys' King Arthur"; (*b*) of read-to-the finish books, like "Ivanhoe," or "The Talisman," or "Westward Ho," or "The Pied Piper," or "The Lady of the Lake"; (*c*) of read-carefully-every-word books, like some of the "Wayside Inn Stories," "Snowbound," "The Great Stone Face," Gray's "Elegy," "Deserted Village."

III. Measuring Reading Ability

Applicability of Existing Scales and Tests in Reading.—We have at our command several tests and scales for the measurement of ability in reading. No one of the series of tests yet devised for the measurement of efficiency in reading combines all the requisites of a good scale—uniformity of test material, standards in rate and its measurement, test of comprehension, and a practical method of scoring results, but they are all of such value as to merit the approval of teachers. For instance, the primary purpose of the Courtis test[1] is to test speed; of the Thorndike[2] scale, comprehension; of the Pinter[3] tests, the value of oral and silent reading in relation to speed. Dr. W. S. Gray has published a large monograph on "Studies of Elementary-School Reading Through Standardized Tests," University of Chicago Press, and has contributed a suggestive discussion to the sixteenth year-book of the National Society for the Study of Education.[4]

Speed in Silent Reading

Mr. S. A. Courtis and Mr. Daniel Starch have both arrived at what they deem fair standards for speed in reading by means of extensive experiments. Speed is measured by the number of words of a given type of material that students can read silently in a given unit of time. The two scales stand as follows:

GRADE	4	5	6	7	8
* Starch (words per minute).....	144	168	192	216	240
† Courtis (words per minute).....	160	180	220	250	280

* The *Journal of Educational Psychology*, January, 1915, p. 15.
† "The Fourteenth Year-Book," part I, p. 56.

[1] S. A. Courtis, "The Fourteenth Year-Book of the National Society for the Study of Education." See also his latest tests for comprehension. Public Schools, Detroit, Mich.

[2] E. L. Thorndike, *Teachers College Record*, September, 1914, and later.

[3] Rudolph Pinter, *Journal of Educational Psychology*, June, 1913.

[4] Public School Publishing Co., Bloomington, Ill.

From this it will be seen that Mr. Courtis maintains that a pupil of the sixth grade in normal reading should be able to read 220 words of simple prose a minute, while Mr. Starch places a lower estimate—only 192 words. The actual rates which each found in the schools tested from which the standards were evolved are as follows:

GRADE	4	5	6	7	8
Starch (words per minute)	144	163	192	222	228
Courtis (words per minute)	165	173	215	252	235

The difference in the standards set by Mr. Starch and Mr. Courtis is doubtless due to the differing conditions governing the tests. The pupils whom Mr. Starch tested knew that their ability to comprehend, as well as their speed, was being tested. Those tested by Mr. Courtis were simply told to read as they usually did. It is, however, interesting to note that a similar test to that of Mr. Starch, given by H. A. Brown, in seven schools, produced almost identical results —the pupils of the sixth grade read 3.17 words per second, or 190 words per minute.[1] From this it would seem safe to conclude that every teacher should be expected to bring her pupils up to the standard set by Mr. Starch.[2] She should aspire to the higher standard, for as Mr. Courtis explains, that degree of skill is needed for social efficiency, and is demanded of the ordinary adult.

Measures of Comprehension.—Professor Thorndike has prepared scales designed to measure visual vocabulary and the understanding of words and sentences.[3] The scale for testing the visual vocabulary indicates the child's ability to classify words which he sees, and consists of a series of unrelated words arranged in lines, the words in each line being of

[1] *The Elementary School Teacher*, June, 1914, p. 484, also published as a bulletin by the State Department of Public Instruction of New Hampshire.

[2] See his "Educational Measurements," The Macmillan Co.

[3] The complete scales as worked out by Dr. Thorndike are obtainable from Teachers College, Columbia University, New York City.

approximately equal difficulty, and the lines differing from each other by equal degrees of difficulty. The line, which a pupil or grade can give 80 per cent correctly is considered to be the degree of difficulty which that child or grade is capable of handling.

The scale for measuring the understanding of sentences or paragraphs is equally exact. Paragraphs varying by equal degrees of difficulty are arranged in a series. The pupils are required to read the paragraphs and to answer a series of questions based upon the paragraphs. Each child's score is in terms of his ability to answer these questions. Such scales have many advantages. The supervisor can say, after using them, that the fourth grade of the West Side School can read literature or text-books of the difficulty of "Set 6" (a series of paragraphs in the scale); while the fourth grade on the North Side can only read paragraphs of a little greater difficulty than "Set 4." A discovery of this sort should be followed by a careful diagnosis of the conditions. The supervisor must determine what should be done. It may be necessary to reclassify the pupils on the basis of their abilities, to change text-books, or to modify the methods of instruction. At any rate the teacher and supervisor have at their command a device which will enable them to discover the strengths and weaknesses of classes and schools so far as reading is concerned.

A set of tests used by Mr. Starch, of the University of Wisconsin, in fifteen schools,[1] a second set used by Superintendent Oberholtzer,[2] a third by Karl Douglas Waldo,[3] a fourth by H. A. Brown,[4] and a fifth by F. J. Kelly[5]—all present schemes by which the comprehension may be tested in connection with the speed in reading. In each case the pupil is

[1] Mr. Starch, *The Journal of Educational Psychology*, January, 1915.
[2] Mr. Oberholtzer, *The Elementary School Journal*, February, 1915.
[3] Mr. Waldo, *The Elementary School Journal*, January, 1915.
[4] Mr. H. A. Brown, *The Elementary School Journal*, June, 1914.
[5] Kelly, "Kansas Silent Reading Tests," Bulletin of State Normal School, Emporia, Kan.

asked to reproduce in writing that which he has read. The methods for scoring reproduction vary. Some count the total number of written words correctly expressing the thought,[1] others count the number of ideas correctly reproduced.[2] The chief objection to the former lies in the fact that some pupils express themselves more tersely than others, and to the latter in the fact that difficulty is experienced in determining just what constitutes one idea. The advocates of either plan, however, prove quite conclusively that these conditions have little weight. Probably the simplest and best test at the present writing (1917) is that devised by Mr. S. H. Courtis, of the Detroit, Mich., public schools.

Index of Reading Efficiency.—One of the most accurate and most elaborate methods of scoring is that used by Mr. H. A. Brown, deputy state superintendent of New Hampshire. In ranking a pupil, he takes into consideration the rate of reading, the quantity of reproduction, and the quality of reproduction—the three combined make up an arbitrary unit of reading efficiency. The mathematical computations which he employs are extremely simple and are clearly explained by him.[3] The following is a table of results which he secured in testing the third grade of the city schools:

School	Rank	A Rate of Reading (words per second)	B Quantity of Reproductions	Quality of Reproductions	Reading Efficiency in Reading Units A and B
A	1	2.16	41.66	35.41	83.24
B	2	2.71	26.94	22.49	56.98
C	3	2.04	27.28	23.59	51.89
D	4	1.94	26.35	21.70	46.61
E	5	2.64	19.23	15.65	46.04
F	6	1.47	29.73	24.11	39.57
G	7	1.08	42.82	27.73	38.10

[1] *Elementary School Journal*, January, 1915, pp. 255–263; Bulletin of the State Department of New Hampshire; *Journal of Educational Psychology*, January, 1915, pp. 11–14.

[2] *Elementary School Teacher*, June, 1914, Mr. Brown. *Journal of Educational Psychology*, June, 1913, Mr. Pinter.

[3] *Elementary School Journal*, June, 1913, pp. 482, 484.

A glance at this table reveals at once that the grades which rank higher in speed are not necessarily excellent in general reading efficiency—School E, for example. The teacher who uses this method of checking can discover whether her room is below par in the speed element or in the comprehension element. If she is striving for rate improvement, she can see by the use of this test, whether she is doing so at the expense of comprehension. One might infer that such was the case in School G, which had a very large quantity of reproduction, but exceedingly poor quality. The use of Mr. Brown's scoring method will show the teacher where she needs to lay the emphasis. Indeed, Mr. Brown believes that he has discovered that the different types of teaching bring widely different results in the three factors of silent-reading efficiency. He expresses the conviction: "It cannot be pointed out too often that reading is more than mere word pronunciation. It is feared that some of our prevailing methods of instruction in primary reading are faulty for the reason that undue emphasis is placed on too rapid and too complete mastery of the difficulties of word pronunciation in the earliest stages of reading at the expense of apperceptive and assimilative activities, and that this type of teaching produces a pronounced word consciousness and a confirmed habit of reading words instead of thoughts from the printed page."[1]

Just how much oral reading is a help rather than a hindrance ought to be determined. If a teacher finds her grade below the average in reading efficiency according to Mr. Brown's method and suspects that too much attention has been given in her grade and preceding ones to oral reading, she should drop it for a time, and devote her efforts to training the pupils in more efficient silent reading.

Materials to Be Used in Testing.—A practical question for every teacher is what material may be used to test children. Mr. Courtis chose a piece of simple prose for conducting his speed tests. Mr. Waldo used selections from the school

[1] *Elementary School Teacher*, June, 1914, p. 489.

paper, *Current Events*, which the pupils were accustomed to reading. Mr. E. E. Oberholtzer suggests that the children may use their own text-books, and may be tested in regard to speed and ability to reproduce with the following kinds of passages: "(1) A familiar passage read some time before; (2) a familiar passage read recently; (3) a new easy passage; (4) a new difficult passage."[1] Average together the results which are secured from these passages to get the ability in silent reading. Mr. Oberholtzer chooses passages that require two minutes to read.

The plan of giving a test intended for one grade to the grade either above or below was adopted by Mr. Starch for purposes of comparison. He offers a graded series of passages as test material. These passages, eight in all, have been chosen from typical readers of the eight grades. But immediately the question arises—how are we to feel sure that the readers differ from each other by equal degrees of difficulty? The only assurance we have is that the results of the test in all of the schools combined indicate a steady increase in ability to read the passages from the first to the eighth grade—a smooth curve rising at a fairly uniform rate.

Time Consumed in Testing.—Another attractive feature of the scale is that each passage is of such length as to take the brightest pupil a little more than thirty (30) seconds to read. If thirty seconds is long enough to insure reliability, the test becomes doubly practical. In order to be sure in this matter, Mr. Starch conducted some tests upon three different sets of passages of varying lengths, and found that an individual's rank is nearly the same in all three. For ordinary purposes, then, it would seem that the interval of thirty seconds is sufficient to insure a fair measure of reliability. Mr. Starch says: "The speed of reading is determined by ascertaining the number of words read per second. This can be done very rapidly by having a blank on which is indicated the number of words to the end of the line. By this blank

[1] *The Elementary School Journal*, February, 1915, p. 315.

the total number of words read can be determined almost instantaneously. Dividing by thirty will give the speed of reading per second. The comprehension is determined by counting the number of words written which correctly reproduce the thought."

Values of the Tests and Scales.—The various units and scales thus far devised for measuring achievement in reading are of value to pupils and teachers and superintendents. They will enable pupils to compete with their past records; they set definite standards of attainment for teachers and will enable them to measure more accurately the work of individual pupils. Adjustments of materials and methods can thus be made more nearly in accord with the needs of pupils. Superintendents can use these tests and scales as devices for comparing the achievements of different rooms, the standards that should be attained by pupils of different ages, and relative merits of different methods of instruction.

SUMMARY

1. Rapid and accurate interpretation of the printed page up to a reasonable standard is a minimal and common essential of the educative process to-day.
2. Instead of training pupils to read by reading the various subjects of study, such as geography and history, the subject of reading has had connected with it the subject of "literature," largely fiction, and principally directed toward developing certain miscellaneous ideals and other emotional changes rather than furnishing information.
3. The problem of reading is principally to develop at an early age skill in silent reading and to furnish children with such reading material as will lead them voluntarily to read enough to fix certain habits and interests in reading for life. Other aims, such as appreciation of good literature, skill in oral reading, getting magazines and books into the homes, and furnishing the great ideals necessary to vital, vocational, avocational, civic, and moral efficiency have conventionally been added to the fundamental aim.

4. By the time children have reached the intermediate grades they should be able to read widely for pleasure and information. Stories have been used to draw children into the delights of reading, but informational matter as found in books, magazines, and newspapers, and as constructed by the children themselves is being used in many schools.
5. Various aids to teachers in giving instruction in oral and silent reading are suggested in connection with position and articulation in oral reading and the use of the dictionary, making intelligent assignments, utilizing the dramatic instinct, reading memory gems, and directing private and home reading for silent and oral reading.
6. Remarkable progress has been made in measuring reading ability, especially silent reading, and setting reasonably attainable standards of speed and comprehension for each grade. When we know what good teachers with typical children can accomplish with certain methods, texts, and devices, and can measure these accomplishments accurately, then we can begin to put at the disposal of all teachers definite standards and the best methods of helping children to attain to them.
7. Thorndike, Kelly, Brown, Gray, Courtis, Starch, and others have organized and improved standard tests of reading ability. There are tests of knowledge of vocabulary, of comprehension, of oral-reading ability, and other abilities connected with reading. Mr. S. A. Courtis has, at the time of this writing, devised very easily applied and accurate tests of silent reading. The teacher should learn what are the latest and best tests and use them, thus measuring not only the ability of her pupils but of her own, and the teachers who have previously taught her group.
8. Training in silent reading is being very greatly emphasized in these tests and investigations. The art of oral reading and declamation will be less emphasized, while silent reading and public speaking will more largely take their place. Recitations in reading will become more like recitations in the content, or knowledge, subjects. It is probable that continued oral reading weakens pupils for the rapid and thorough reading they need to do out of school as children and adults, while training in silent reading promotes these abilities.

PROJECTS IN APPLICATION

1. Learn what is the best test in *silent* reading for pupils of your grade; send for enough copies of the test; and test your pupils in speed and comprehension with it.
2. Take Gray's *oral* reading test as given in his "Studies of Elementary-School Reading through Standardized Tests" and compare results with it and those obtained by your silent-reading test.
3. What conclusions as to facts and as to methods do you draw from the following comparison of rates of oral and silent reading as made by Oberholtzer (*Elementary School Journal*, 15, February, 1915), after a study of rates for 1,800 pupils. Results are given as number of words read per second. What would be differences in words for an hour's reading if the rate were constant?

Grade	3	4	5	6	7	8
Oral-reading rate	2.1	2.3	2.4	2.8	3.1	3.9
Silent-reading rate	2.3	2.6	3.1	3.9	4.7	4.8

4. What arguments for *silent* reading does Gray make in his monograph in the "Sixteenth Year-Book of the National Society for the Study of Education" (Public School Publishing Company, Bloomington, Ill.)? Are they valid? What shall be the place of oral reading?
5. In the same volume take the graded list of *children's library books* for schools as worked out by Munson and Hoskinson, check the list for one grade or group of grades and mark any you find that should not be offered pupils of those grades and write down any books you think should be included.
6. What good methods have you seen used for getting either a general public or a school library located at a public school? What responsibility has a teacher of reading for the outside reading of the children and adults of the community?
7. In some high schools the separate period for *English* is being given up while correct English is being emphasized in all classes, and any teacher feels free to bring in fiction with which to cultivate ideals and appreciations along the line of his subject. Do you know of any attempts to give up separate *reading* classes in the elementary school? Are they successful?
8. What function of reading is being partly cared for by the motion picture for many children?

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CHAPTER IX

ARITHMETIC

Preliminary Problems

1. What work in arithmetic must every one be able to do in order to carry on the ordinary occupations of life?
2. What types of operations or problems in arithmetic, as you studied it, do not meet the requirements of question 1?
3. What are the two or three largest topics usually taught in the several school years, and do these seem to be well chosen?
4. What is your opinion of the value of any single method about which you have read? What is the method, and on what great principle does it seem to be founded?
5. How does the work in mathematics in the first twelve school years in the United States compare in extent with that done in the other leading countries?
6. What is your view as to the importance of supervised study in arithmetic and as to the means of carrying out such work?
7. What works have you read on the teaching of arithmetic, and what other leading works are there which you might read with profit?
8. What is your opinion as to the nature of a good problem in arithmetic?
9. What is your opinion as to the value of pupils' analyses of problems and of the formal explanation of an operation like the division of fractions?
10. What do you consider the minimum essentials of arithmetic which all should thoroughly learn?

I. Introduction

The General Problem.—The general problem of teaching arithmetic is not a particularly complex one. If we seek merely the ability to perform those calculations which are needed by the average citizen in his daily life, this ability can be imparted to the child without any great difficulty. The problem is far easier of solution than is that of teaching Eng-

lish, biology, or history, because it is much simpler and more direct. It is true that we have complicated it in all sorts of ways, trying to use arithmetic as a cover for various other subjects, and in doing this we have made the work unnecessarily difficult; but the subject itself, so far as it involves merely the ability to do practical calculations, is relatively simple. The average citizen needs to know how to add, subtract, multiply, and divide whole numbers. This is the chief thing that he is called upon to do in arithmetic, unless we add thereto the adding and subtracting of decimal fractions as shown in the case of United States money. Next in order will probably come the ability to find a fractional part of a number, say of 16 inches. Next will come, perhaps, the finding of some per cent of a number, say 5% of $125. And next, the citizen will need to know how to multiply and divide a mixed decimal (dollars and cents) by a whole number. Given this equipment, the average person will get along very well so far as mere practical calculation is concerned. If we were certain that children when they leave school could perform these operations with perfect accuracy and fair rapidity we might be reasonably well satisfied, and we should not hear the continual complaint that our pupils are weak in the essentials of arithmetic.

So much for these essentials. Surely, with six or eight years at our command, we should bring the children to such proficiency in these processes as to leave no ground for reproach. That we fail to do this is because we encumber it unnecessarily with other features, manufacturing trouble without any real justification for it.

Troubles.—Now what are these troubles which we pile up before the children? Some are more or less necessary, while others are quite the reverse. In the first place, we take about a year in which to teach fractions. Some of this work is necessary, particularly the case above mentioned, that of finding a fractional part of a number. But will any reader of this page ask himself when he last had occasion to add two

fractions like $\frac{2}{3}$ and $\frac{3}{4}$, or when he last heard of any one else doing so? And, having answered that, will he ask when he last had occasion to subtract, say $\frac{2}{3}$ from $\frac{3}{4}$? or to multiply these fractions together? or to divide one by the other? and when he last heard of any one doing so? And, after these questions have been answered to his satisfaction, will he ask himself when he was last called upon to divide one decimal fraction by another? or to add, let us say 15 gal. 1 qt. to 27 gal. 2 qt.? or to multiply 18 lb. 12 oz. by 7?

This does not mean that we can give up the teaching of fractions and compound numbers. We have to do more or less of this work for the benefit of the few who will use it, knowing all the time that the child must learn it while young or he will never master it, and realizing that, even if he does not use it, he is having continued drill in calculation while studying it. But the object of the remark is to show that there are relative values in arithmetic, and that these values are not sufficiently recognized. We tend to teach the division of one fraction by another, which not one person in a thousand ever uses, as if it were equally as important as addition, which every one uses frequently. The fact is, we overemphasize the importance of fractions and compound numbers, and we underestimate the relative value of the more necessary part of arithmetic mentioned above.

What has been said of certain of these processes, however, becomes more serious when we contemplate the fact that a considerable part of our work with fractions often includes such cases as $\frac{2}{23} \times \frac{13}{15}$ and $2\frac{3}{17} \div \frac{5}{27}$, cases which are wholly unwarranted either by the demands of business or by sound educational principles, except as a few problems may be given as curious examples.

When we consider the *applications* of arithmetic we find an even greater lack of appreciation of relative values, and of these there will be mention later in this chapter.

Let it suffice, therefore, to repeat that the problem of teaching the essentials of arithmetic is not a difficult one.

We must teach some things which are not essential to the great body of people; but, once we understand something of relative values, we may place the emphasis where it more properly belongs, feeling less concerned with perfection in such relatively unimportant topics as must still have place in our schools.

A General Survey of the Curriculum.—There are so many variants of the curriculum in arithmetic that it might at first seem a hopeless task to try to find any points of agreement. In reality, however, there is more agreement on the large questions than one would think at first sight. The lack of uniformity is most apparent in minor matters, usually of no great consequence.

The curriculum of the first four years is quite the same, so far as its large features go, in all leading countries. At the close of the fourth school year the child is supposed to know the four operations with integers, the meaning of fractions, the most common tables of measures, and the meaning of the decimal point in the writing of certain denominate numbers (in our country, United States money). An examination of the courses of study in all of these countries shows this practical uniformity. In some places there will be included the four operations with simple common fractions; in others, two operations are required; while in others a little more attention is given to decimal forms (as in multiplying United States money). But the great features are the same, and these should not be obscured.

After the first four grades America rapidly falls behind the other leading nations. Our general plan is to make common fractions the central feature in Grade V, decimal fractions and some percentage in Grade VI, percentage and its applications in Grade VII, and business arithmetic in Grade VIII. This is more or less varied, however. For example, one of our best courses of study makes decimal fractions the centre in Grade V, and common fractions in Grade VI. Of course, the pupils acquire some knowledge of common frac-

tions in Grade IV, so that this arrangement is entirely feasible. Furthermore, many schools join a considerable amount of work in the applications of percentage to the work in Grade VI, a desirable thing to do, particularly in view of the fact that the Junior High School will probably reduce, by at least half, the arithmetic of Grades VII and VIII. But in a large way the curriculum is about what has been set forth above.

As stated above, the United States begins to fall behind other countries in Grade V. There are several reasons for this; but since the same conditions are found in relation to other subjects, these reasons should be studied in connection with the general problem rather than in a chapter on the teaching of some particular subject. The nature of the work in the various school years will be considered later.

Method.—A generation ago the subject of methods played a more prominent rôle than it does at the present time. Every normal school had as its central feature the work in methods. Usually the courses in this subject did little more, with respect to teaching arithmetic, than give to the prospective teachers just what any good text-book would give, namely, the explanations of the various topics and operations. Occasionally some enthusiastic teacher would venture upon some supposedly new plan of teaching this thing or that; frequently ideas would be advanced which had long before been discarded as impracticable; but in spite of it all the courses did much good because they concentrated the attention of the novice upon the chief difficulties of the subject.

At present there is a more scholarly idea of methods than was formerly found in educational circles. Teachers have grown suspicious of those who magnify the little methods which they may have devised for teaching any subject. The impression has become well established that one of the easiest things in the teaching of arithmetic is the creation of "Method"—and one of the most useless. We may start off upon the idea that all number is measure, and hence that

arithmetic must consist of measuring everything in sight—and we have a "Measuring Method." It will be a narrow idea; we shall neglect much that is important; but if we put energy back of it we shall attract attention and will very likely turn out better computers than a poor teacher will who is wise enough to have no "Method" in this narrow sense of the term. Again, we may say that every number is a fraction, the numerator being an integral multiple of the denominator in the case of whole numbers. From this assumption we may proceed to teach arithmetic only as the science of fractions. It will be hard work, but, given enough energy and patience and skill, the children will survive it and will learn more of arithmetic than may be the case with listless teaching on a better plan. We might also start with the idea that every lesson should be a unit, and that in it should come every process of arithmetic, so far as this is possible, and we could stir up a good deal of interest in our "Unit Method." Or, again, we could begin with the idea that all action demands reaction, and that every lesson containing addition should also contain subtraction; that $6 + 4 = 10$ should be followed by $10 - 6 = 4$ and $10 - 4 = 6$; and that $2 \times 5 = 10$ should be followed by $10 \div 2 = 5$ and $10 \div 5 = 2$. By sufficient ingenuity a very taking scheme could be evolved, and the "Inverse Method" would begin to make a brief stir in the world. This, in fact, has been the genesis, rise, and decline of methods; given a strong but narrow-minded personality, with some little idea such as those above mentioned, this idea is exploited as a panacea; it creates some little stir in circles more or less local; it is tried in a greater or less number of schools; the author and his pupils die; and in due time the method is remembered, if at all, only by some inscription in those pedagogical graveyards known as histories of education.

The object in writing thus is manifest. For the teacher with but little experience there is a valuable lesson, namely, that there is no "Method" that will lead to easy victory in

the teaching of arithmetic. There are a few great principles that may well be taken to heart, but any single narrow plan and any single line of material will be fatal to the best success. In this same spirit the National Education Association only a few years ago expressed itself as follows: "The complaints of business men that pupils from the schools are inaccurate in results and careless of details is a criticism that should be removed. The principles of sound and accurate training are as fixed as natural laws, and should be insistently followed. Ill-considered experiments and indiscriminate methodizing should be abandoned, and attention devoted to the persevering and continuous drill necessary for accurate and efficient training; and we hold that no course of study in any public school should be so advanced or so rigid as to prevent instruction to any student, who may need it, in the essential and practical parts of the common English branches."

Eccentricities in Teaching.—Before considering the work in detail, a word should be said as to those eccentricities of teaching which constantly appear and which tend to cloud the general problem. It is necessary that the world should continue to experiment if it would continue to advance. But it is not necessary that it should continue to try experiments which have been repeated hundreds of times and which have been proved unsuited to the needs of the general body of teachers. Any method, mode, device—call it what we will, is likely to succeed with the individual who feels himself the author of it, because it is put forward with the enthusiasm of a zealot; but for the profession at large the great mass of these minor devices are of value only as suggestions for occasional use.

In particular, a method like that of Grube is certain to fail because it is based upon a false idea, namely, that every number should be thoroughly known before the child proceeds to the next one. Great teacher as Pestalozzi was, his idea of consciously treating every number as a collection of units, as in $2 \times 1 + 5 \times 1 = 7 \times 1$, was too narrow to

admit of general success. Enthusiast as Tillich was, his plan of continually using sticks of various lengths in teaching number relations was not a good one for the schools at large; it was suggestive of occasional development work, but it was a very stupid method for constant use. So the habit of always being tied to some particular number table, or style of fraction disk, or box of blocks, or sets of cards, is a bad one. These devices have their place, but it is not desirable to be eccentric in their use. The same thing may be said of oral arithmetic; it is not merely desirable to have it, but it is essential to the pupil's success. But when some school authority demands that there should be no written work whatever in the first four years, an eccentricity of judgment is apparent. A few years ago there was the same eccentricity of having no arithmetic in the first school year, and some even advocated its elimination in the first two or even three years. Like all such extremes, this has passed away, and at present we merely hear that it should be taught "incidentally," "as it naturally arises," or "as it functions in the life of the child" —this last being a particularly pleasing phrase in educational gatherings. This particular eccentricity arose, as many others have, as a protest against an evil; arithmetic had been stupidly and too formally taught in Grade I, and hence the educator comes along and pursues his usual course of saying: "Let us cut it all out." He has done that so often that the world is getting used to it; he is continually doing it for algebra, grammar, physiology, ancient history, and various other subjects—always seeking to destroy, rarely seeking to remedy defects.

At present the prevailing ideas of those whose interest lies rather in pedagogy than in mathematics relate to measurement of efficiency and to problem material which concerns only the immediate needs of the child. The former has resulted in such plans as the Courtis tests, the most scientifically worked out of any similar devices for measuring the work of any given grade in arithmetic. A school will do well to adopt

tests of this character so long as it recognizes that the results are averages, and that we cannot expect to bring all pupils up to these standards. The relating of all problem material to the immediate needs of children is not so easily sanctioned, since in its ultimate analysis it would take away much of the preparation which the schools must give for after life.

II. Arithmetic in the Lower Grades

The Present Interest in the Subject.[1]—There is no subject in the curriculum of the elementary school that is exciting more interest to-day than arithmetic. Yet, although the subject has been studied, experimented upon, and discussed for a great many years, there is no uniformity of opinion concerning some of the great principles of its teaching.

It was not until the time of Pestalozzi that any serious attempt was made to teach arithmetic to young children, and as a result of the work of this great teacher the subject began to appear much earlier in the school course. Pestalozzi made arithmetic attractive to young children by making the subject real to them by means of objects and by appeal to their every-day interests.

Professor Henry Suzzallo, in his little book on "The Teaching of Primary Arithmetic," says of present-day arithmetic teaching that "The grind of sheer mechanical drill decreases in teaching, and a reasoned understanding of relations, in some degree at least, is substituted. Artificial motives and incentives are less frequently used to get work done, while the quantitative needs of the child's life and the intrinsic interest of children in the institutional occupations of their elders provide a more vital motive for the use of arithmetic."

Value of Experience.—Because of the great variety of opinions concerning the teaching of arithmetic, the best that teachers of the subject can do is to learn what experiments

[1] This section was written by Miss Worden.

have been made, and what results have been secured with the best-known methods, and then be guided accordingly. As Mr. S. A. Courtis says in his "Better Teaching of Arithmetic," "Ours is the fortunate day of a new ideal. On every side is heard the insistent demand for a scientific survey, not only of education, but of every form of social activity that makes for human betterment."

There have been all sorts of experiments in primary arithmetic, some going to one extreme and some to another, the tendency to follow a new fad being quite evident in text-books and courses of study which have appeared from time to time. A comparative study of courses of mathematics and results obtained, both in this country and Europe, should give us valuable assistance in determining the answers to such questions as: When shall we begin the study of arithmetic? How shall we teach the subject? And how much shall we require of the child?

Such a thorough study of ways and means as was made by the teachers at Connersville, Ind., when getting out their course of study in mathematics, should be of valuable assistance to the progressive teacher who, in the light of modern psychology, pedagogy, and child-study, desires to make his work most profitable for the child.

Experience Abroad.—Any one who knows about the amount of mathematical attainment of children in European countries will admit that they are much in advance of children of the same age in the United States. As a consequence, when the European child is ready to leave the elementary school he is much better trained. Of course, there are many things to take into consideration in making such a comparison, such as the employment of better-trained teachers generally, and the shorter vacations, while even the general use of the metric system of weights and measures is proved to be considerable of a time-saver. The valuable investigations of J. C. Brown, president of the State Normal School, Winona, Minn., on comparative attainments of European and Ameri-

can pupils in mathematics bring out this fact very clearly.[1] They bring out the question as to what there is in their system that is worthy of imitation, and lead us to ask if our schools are so organized and our conditions are such that we can adopt the method used abroad.

When Arithmetic Should Begin.—Let us discuss the question first as to *when the child should begin the study of formal arithmetic.* "Not to put arithmetic as a topic in the first grade is to make sure that it will not be seriously or systematically taught there in nine-tenths of the schools of the country. The average teacher, not in the cities merely but throughout the country generally, will simply touch upon it in the most perfunctory way. Whatever of scientific statistics we have show that this is true, and that children so taught are not as well prepared when they enter the intermediate grades in arithmetic as those who have studied the subject as a topic from the first grade on." [2]

J. C. Brown, in his investigations mentioned above, data for which were secured from the reports of the International Commission on the Teaching of Mathematics, finds that in almost every country in Europe arithmetic from four to six periods a week is required of all children the first year in school, and in almost every country children enter the first year between the ages of six and seven years, the notable exceptions being Finland and Russia, where children enter between the ages of seven and eight. And so we should find it if we examined the courses of study of the most progressive cities and states in our own country. Social and economic conditions in this country are very naturally having their effects upon the school and in no particular branch is this more evident than in the arithmetic required in the best courses of study. Mr. Brown found that in Europe there was great variety as

[1] This monograph was prepared under the direction of the American members of the International Commission on the Teaching of Mathematics, and was published by the United States Bureau of Education in 1914.

[2] David Eugene Smith, "The Teaching of Arithmetic," Boston, Ginn & Company.

to just what was to be required during that first year, but practical uniformity in requiring much oral work. The daily drill in mathematics is provided in almost every course from which reports were obtained.

The committees at Connersville mentioned above, which were appointed to draw up a course in mathematics for that city, examined seventy-eight courses of study from thirty-three states, and in sixty-one of them arithmetic was required in the first grade. This committee, in addition to the study made of courses from other schools, consulted with teachers and business men before making their recommendations, so we may feel sure that the work was very carefully planned and is entirely reliable.

Importance of Oral Work.—The question as to the general principles of teaching the young child is one upon which there is more agreement. To be sure, we have had all sorts of fads and devices which have appeared from time to time, as, for example, the intensive study of one number as it is taken up, so well illustrated in the Grube method. There have also been such efforts as the Speer method, the extreme spiral method, and the visualizing method, all of which have had their value and have helped to better the teaching of this important subject in spite of the extreme views of their advocates. No one believes that any one of these methods is safe in itself, but each has its good features. Upon one thing, however, all writers now agree, namely, that the primary work should be *largely oral*. Superintendents, supervisors, and county overseers have considerable difficulty, especially with untrained teachers, in this particular. It is well known that it requires more effort on the part of the teacher to conduct a good oral lesson than to assign written work for pupils to do either on the blackboard or at their seats, but it is vital to good work, and the teacher who cannot carry it on successfully is sure to fail.

Furthermore, there is the important question of time. In the rural school, where the teacher has but a few minutes,

often only ten, for her primary class each day, it is much more difficult to make satisfactory progress in a subject when the work is largely oral. But in spite of the difficulties of teaching the subject in this way it is generally agreed that oral work should have great prominence in the early study of the subject.

Lack of Preparation.—The writer, having taught in a State normal school for a number of years, and having had considerable experience in the preparation of young people to teach in both country and city schools, knows something of the lack of preparation of even our supposedly trained teachers in arithmetic. Time that should be spent in the study of general principles and methods has often to be devoted to academic work, even high-school graduates being often found who do not know the forty-five combinations either in addition or in multiplication so that they can give them quickly. The country-trained children, who often are preparing to go back into the country to teach, are even worse off. What kind of rapid oral drill will they be able to give a primary class in arithmetic? They have been poorly trained themselves, and a term of from ten to twenty weeks in a normal school in professional arithmetic cannot do everything that is necessary to overcome their lack of training in earlier years. The next generation, however, with earnest effort on the part of our conscientious young teachers, will show great improvement in these particulars. Time now being spent in normal schools on academic work which belongs in the elementary school can then be given more largely to professional training.

Use of Objects.—Another feature which is generally accepted in the methods of teaching primary arithmetic is the constant employment of objects in the beginning of the work. Great care must be exercised, however, that this object-teaching is not carried too far, for a child must not be kept on a milk-and-water diet when he is ready for solid food.

As the young mind requires frequent change, the teacher

should remember this fact in preparing her lessons, and should vary her class work accordingly. There are many excellent aids and suggestions which will be helpful to her, and which may be secured at little or no expense. In early life the desire to play games is a strong one, and an appeal to this side of the child's nature always meets with a ready response and gives the teacher opportunity to vary her lessons. Many a child has been interested to learn numbers so that he might play dominoes with an older brother or sister, and many a boy has maintained his interest in percentage in order to learn how to compute the baseball percentages. An excellent list of games is given in Doctor Smith's "Teaching of Arithmetic," Chapter 14. An ingenious teacher, however, can make a game of any number lesson by looking upon it as a contest in which a score is kept, the class being divided into competing sections. The spirit of good-natured rivalry is one to which the teacher may often appeal in the primary grades. Great care must be exercised, however, that the game idea is not carried too far, and that the purpose of the lesson be not forgotten.

Nature of the Arithmetic.—There has been much complaint in years past that the kind of arithmetic which children have been getting is not the kind that they will use when out of school. This criticism has had its effect upon the school course, and the result is an elimination of all but the essentials, and a demand that these essentials shall be thoroughly mastered. Too much emphasis cannot be put upon the importance of frequent reviews and daily drill. The results of an investigation of J. C. Brown, published in the *Journal of Educational Psychology* a few years ago, may be of interest here. He showed the comparative progress of two classes as nearly alike as possible, one class having a daily drill period of five minutes on fundamental operations and the other not. The result showed that the class with the drill period increased its speed as well as its accuracy, the drill seeming to act as a sort of tonic. The effect upon the poorer students was especially noticeable, and after the long vacation another test

showed that the drill class had retained the number relations much better than the non-drill class.

Changes in Teaching.—The changes in teaching brought about during the last few years have come through pressure brought to bear from both within and without the school. A scientific study of methods and of the development of the child has brought about changes coming from the school itself, while changes in economic conditions and other facts requiring a practical knowledge of the business transactions of every-day life have brought about changes coming from outside the school. We no longer hear serious defenders of the idea of teaching arithmetic for what was once thought to be the best *mental discipline.* At the present time parents and business men are demanding that the school shall prepare the child so that when he leaves the elementary school he shall be able to do the arithmetic required of the average citizen, and do this with accuracy and reasonable rapidity. In consequence of these facts our primary arithmetic must be largely drill work upon the fundamental operations, and upon simple problems that appeal to the life interests of the child.

In recent years our work in the primary grades has become more rational. If one steps into the room of a first-class teacher of primary arithmetic he may see work quite different from that which was common a few years ago. The teacher may be conducting a lively oral drill on simple combinations, the children being on the alert and ready to answer quickly when called upon. In a few moments the work may change to some exercises in actual measuring and computing, the children moving about the room freely and quietly. Or the class may be purchasing the foodstuffs for the day's luncheon, use being made of current prices which have been obtained by the children themselves. A part of the hour may be devoted to an interesting game in which a score has to be kept. If the class is in the country, problems relating to the farm may be the subject of the day, the farm furnishing excellent material for such work in arithmetic. The text-book may

be in use, but if so the prices will be revised to suit local conditions of the day. No long explanations will be required of children in the lower grades, but the teacher will be sure that the children understand the work and by careful questioning will bring out the reasons for the processes used. The visitor will find that the teacher always requires accurate statements, no child, for example, being allowed to state that 80 acres of land at $100 per acre will cost $100 times 80 acres. The teacher will not permit the children to say that the area of the schoolyard is 4 rods times 6 rods, or 24 square rods, even though such forms have a legitimate place in physics. Although children and even high-school students write such careless expressions as $2 \times 7 = 14 + 4 = 18 \div 3 = 6$, the visitor to the model schoolroom will not find work of this kind, since it is apparent that 2×7 does not equal $14 + 4$, and that this equals neither $18 \div 3$ nor 6.

Experience proves that children like to count, to measure, and to work with numbers. They like to solve problems which appeal to them, for they enjoy the satisfaction of really having done something in the line of discovery. The teacher may often add interest to an abstract process by showing the children what they may do when the new process is learned.

The writer once saw this idea of anticipation as a stimulus used in a class in third-grade arithmetic. The teacher stepped to the board and put before the class a problem in the addition of three-digit numbers involving carrying, a problem the children could not do, and then said: "How many of you would like to learn how to do that?" Of course, they all wanted to know how and the teacher began her lesson. Splints (which had been used before in the explanation of the place value of numbers) were passed to the children, less than ten being given to some, groups of tens bound by rubber bands being given to others, and bundles of groups bound into bunches of hundreds to others. The teacher then brought before the class three children—one units' child, one tens' child, and one hundreds' child. Numbers were then

called upon to add their splints to those of the children representing the number before the class. Units' child was to bind ten splints quickly, and pass them to tens' if he received as many as ten, and the tens' in the same way was to bind and pass on to hundreds'. The teacher put down on the blackboard the results in symbols. The exercise became a sort of game, and at the end of the lesson the children had a clear idea of how to add and carry. Upon going to their seats some problems involving the new principle were given and were solved under the direction of the teacher.

The Study Period.—There is a great advantage in the teacher's having charge of the study period. In this way tendencies may be corrected before habits are formed which are difficult to break. Furthermore, if the pupil works under the direction of the teacher, habits of dawdling may be prevented, habits which are fatal to good work in arithmetic. Let me quote here from an article in the Thirteenth Year Book of the National Society for the Study of Education, written by E. R. Breslich, of the University High School, University of Chicago. Mr. Breslich says: "One of the most pressing problems before the educational public at the present time is to find a means of eliminating the enormous waste of the time of pupils that results from two conditions which prevail in the schools, namely, the failure to provide for the individual differences in capacity found among pupils in the same class, and failure to organize the studying done by pupils so as to avoid the futile efforts which they now put forth to master lessons assigned for home work. One of the most important factors in solving both parts of this problem is the organization of periods for supervised study during school hours."[1]

The Pueblo plan or the Batavia system of supervised study, although subject to criticism, greatly assists the

[1] See also Dearborn's "How to Learn Easily," Hall-Quest's "Supervised Study," Kitson's "How to Use Your Mind," and Whipple's "How to Study Effectively."

weaker and slower pupils in making progress. Similar methods also provide for the very bright pupils, a class of children who have been much neglected in the past, and who are rarely considered in most educational discussions even today.

This guidance of the study period is much more difficult in the country school on account of the lack of time, but it is often possible to ask a pupil in the upper grades to act as an assistant. The supervisor may often encourage the use of short cuts and mental work when, if left alone, the children would use long methods and the pencil. This is especially true in text-book work.

Work to Be Done in the Primary Grades.—The question as to just what should be taught in the primary grades, say the first four years, is one upon which authorities are not at all agreed. In most schools the teacher will find a course already planned, which must be followed more or less rigidly. The writer suggests the following as only tentative and as the result of conclusions drawn after examining many of the best courses offered in this country.

Suggestions for the First Grade.—In this grade the work should be based upon counting and be largely oral and memory work. Objects should be used very freely, and an attempt should be made to rationalize the work as far as possible. At the end of the year the children should be able to count to 100 by 1's, 2's, 5's, and 10's. The simple combinations to 10 or 12 should be learned. There is no need to limit the upper range, for it is much easier to add 5 and 10 than 5 and 6. Since children enjoy counting, they may be asked to begin with 1 and add by 2's to 13, or begin with 2 and add by 3's to 14, and so on with other numbers. Attention may be called very early to *endings* in addition, as in the cases of $0+5=5$, $10+5=15$, and so on. In this grade the Roman numerals, as they come in chapters or lessons, or as seen on the clock face, may be taught.

The fractions ½ and ¼ may be learned in a concrete way.

Most children know the idea of these fractions when they enter school. The foot rule in measuring will give an idea of foot, of inch, and perhaps of yard. The teacher should always remember that children learn to do by doing. In this grade the teacher can develop the idea of number through the eye, the ear, and the hand, and can also make use of the motor activity of the child. The young teacher will find great assistance in Doctor David Eugene Smith's book on "The Teaching of Arithmetic," in the chapter on "Work of the First School Year." The game element may be appealed to early in the first school year, since there are many excellent games suitable for this grade. The work of the recitation period must be varied for young children, for they can be kept interested in one kind of thing for only a short time before showing signs of fatigue. Number primers, like the Wentworth-Smith "City Arithmetic, Grade I," or the "Work and Play with Numbers," are valuable. Publishers of school supplies now have such excellent helps for teachers, and at reasonable prices, that most schools now make use of such helps all through the primary grades. Number cards, fraction disks, number tables, splints, and the like, can be procured through any of the large supply houses.[1]

Suggestions for the Second Grade.—In the second year the reading and writing of numbers to 1,000 should be taught, with counting by 2's, 3's, 4's, 5's, 9's, and 10's. In counting by 9's, the child should notice that he adds one less than 10 every time, but he should not rely upon this fact in his rapid work. In adding columns of numbers, the grouping by tens may occasionally help in the accuracy and rapidity of the work. The remainder of the forty-five combinations should be learned and should be the subject of daily drill. There should be much oral work in this grade, as in all the primary grades. When the children have learned to read, a text-book may be used to advantage, the text being employed

[1] For example, the Educational Equipment Company, 70 Fifth Avenue, New York.

only as a help to the teacher, and not being looked upon as dictating exactly what is to be done. The so-called dramatized occupations, such as buying and selling, may be of use in this grade, especially in the city where young children make actual purchases more frequently than in the country. The coins should be recognized, and the reading and writing of dollars and cents should be taught. The fractions ½, ⅓, ¼, and ⅛ may be applied in such simple problems as these: One-half of a gallon equals how may quarts? or, One-third of a foot equals how many inches? The actual measures should be used in teaching the meaning of such words as pint, quart, and gallon. The multiplication tables to about 5×10 may be learned this year. Additions of two-figure numbers not involving carrying may be taught, and the subtraction of such numbers may be taken up, preferably by the addition method. The addition method of subtraction is not universally used, but some schools require it, and it should be familiar to all teachers. It is illustrated in the following problem: Suppose you were to subtract 26 from 88. Instead of saying, "6 from 8 leave 2," you would say, "6 and 2 make 8," writing the 2. In the same way you would say, "2 and 6 make 8," writing the result, 6. Children who already know another method, and subtract easily and accurately, should not be forced to learn a new method of this kind.

In the drill work the teacher should aim to have the results given quickly, and should not allow the child time to "count up." He knows how the result is obtained, and the teacher would better give the result to the child, requiring him to memorize that particular combination for the next day, than to have him form a habit of counting for each case. These combinations should be recognized by the eye and the ear at once.

In the teaching of such geometric figures as come up in this year's work, including the square and circle, paper folding and cutting will be of assistance, especially in the work in fractions.

Children of this age delight in making up number stories, and this practice is not only good drill for arithmetic, but is also of value in language work.

Suggestions for the Third Grade.—In the third year the counting can be made more difficult; for example, the children may be asked to begin with 2 and add alternately 3 and 4. They may also be taught to add 6's and 7's, or, in other words, they may use this simple method to complete their addition tables and multiplication tables. Whether the tables shall be taught to 10×10 or to 12×12 depends upon the course of study and the ability of the class. There is little more reason for stopping at 12×12 than for going on to 15×15; but, on the other hand, there is little reason for going beyond 10×10 in our country, the table 12×12 being a relic of English teaching, where it is made necessary by the fact that 12 pence make a shilling. Numbers may be separated into their prime factors, and the simpler factors may be learned in this year; but the work should not be carried far, because we seldom have occasion to reduce fractions to lowest terms.

Division by one-digit numbers, as far as the tables are learned, may be required, always using short division. Some teachers prefer the quotient written above the dividend in short division, because it is so written in long division for convenience in placing the decimal point, but the practice is opposed to business custom, and the plan is inconvenient in subsequent work in mathematics. Easy long divisions may be taught in the latter part of the year.

Much concrete work in measurement may be done in this year, especially in connection with simple problems in drawing to a scale. Playing at keeping store, if carefully conducted by the teacher, may prove very profitable. Actual prices should be used, and the children may be required to find prices by inquiry at home the day before the work is given. Empty labelled cans and cartons may often be secured by application to the large firms handling the goods,

but they are preferably brought from the children's homes. To make the work more real, toy money also may be used.

The reading of problems, and the explaining of the processes involved often proves a profitable exercise. In one or two of our standard text-books there are lists of "problems without numbers," which are excellent for such purposes. In every process there should always be the spirit of time-saving, but not that nervous haste which is so discouraging to the slow. A minimum of time should be the aim of both teacher and pupil, always keeping in mind that accuracy comes first.

Suggestions for the Fourth Grade.—At the beginning of every school year there should be a thorough review of and drill upon the work of the preceding grade. We all know how easily children forget, especially during the long summer vacation. By means of simple tests the teacher may learn the mental equipment of her children, and what their stumbling-blocks are. The "Standardized Tests" of Mr. S. A. Courtis are especially beneficial for the advancement of the pupils, if the teacher will carefully make use of the results obtained by such examinations.[1] This is especially true of the first tests. Drill upon the weak points, with especial attention to the slow pupils, will greatly help to increase the efficiency of the work given during the rest of the year. The review may put in the form of tables the facts learned during the preceding years; for example, the tables of linear measure, capacity, and the like, should now be memorized.

At the end of the fourth year the fundamentals and foundations of the science of arithmetic should be thoroughly mastered. The forty-five combinations, both in addition and in multiplication, should be known at sight, the multiplication and division tables should be learned, the fundamental operations of addition, subtraction, multiplication, and division should be so well known that any simple problem involving them can be quickly solved. The addition and subtraction of simple fractions whose denominators can easily

[1] Public schools, Detroit, Mich., sold at cost.

be factored may be studied in the fourth year, together with some work involving very simple decimals, particularly with reference to dollars and cents. The work now admits of a much more extended use of the text-book, the teacher selecting and supplementing whenever the text does not supply the needs of the class. Simple problems involving cancellation may be taught, and the children may then be asked to indicate the operations and cancel equal factors whenever this is possible. If the child is well drilled upon the work of the above outline, he should be able to enter the intermediate grades, feeling confident that, even if the work is more complicated, he will not be hindered by a lack of knowledge of the fundamentals.

Note.—Summary, problems, and references will be found at the end of the next chapter.

CHAPTER X

ARITHMETIC
(CONTINUED)

III. Arithmetic in the Upper Grades

Work Presupposed.—When the child enters Grade V he is supposed to know thoroughly the forty-five usual combinations in addition, and the same number in multiplication. That is, we have nine characters, 1, 2, . . , 9, and we can add 1 to any one of them, giving nine combinations with 1; we can add 2 to any one of them, but since we already have $2 + 1$ there are only eight new combinations; with 3 there are seven new combinations, and so on, so that the total number of different combinations is $9 + 8 + 7 + \ldots + 1 = 45$. This excludes combinations with 0, which must be known, but which are so simple as to be excluded from the forty-five. It also gives only $3 + 2$, not $2 + 3$, and this is in accord with world experience. Indeed, in learning the multiplication table it is a question whether we do not make a mistake to require both 9×7 and 7×9 learned, either one serving the purpose quite well. But whatever be the answer to these minor questions, the child must now know these forty-five combinations if he is ever to know them. Furthermore, he must know them both in tabular form and as isolated facts if he is to know them well, whatever some theorist may say about the danger of learning the multiplication table. One of the constant complaints in those European schools to which our children are frequently sent is that they do not know the addition and multiplication tables thoroughly, with the result that they cannot keep pace with children of the same age who have been well taught. This work should be

done thoroughly in the primary grades, and the teacher in Grade V should merely have to review it, not teach it anew. There is also presupposed the ability to perform the four operations with any ordinary integers. To be sure, this must be continually reviewed, and in this work some such device as the Thompson "Minimum Essentials" or the Courtis tests is very helpful, but the operations themselves must be presupposed in any well-regulated school system.[1]

There is also presupposed a familiarity with the common tables of measures, and at least a fair knowledge of the meaning of fractions.

Upon such a basis the teacher of Grade V can build; without it the structure will always be weak.

Nature of the Problems.—In Grades V–VIII, the nature of the problems changes from the isolated type, which illustrates the particular operation, to a more general type. It is, therefore, desirable to consider the various types of applied problem which we find in arithmetic.

When arithmetics were first printed, no problems were included except such as were completely solved. These were, in the strict sense of the word, "*examples*" to be followed. When the boy went into his apprenticeship he solved such problems as naturally arose, referring back to the example in the book to find how to proceed. As schools came to be more common, boys attended who were not going to be apprentices in some particular trade, and books were prepared which supplied a small number of applied problems in various fields, chiefly mercantile. It is only very recently that modern life has required such facility in arithmetic that a large amount of abstract drill work is necessary, accompanied by a large range of applied problems.

At the present time there are several types of exercises in arithmetic. First, there is the problem which involves only the work which has just been studied; that is, a child who is adding fractions is given a number of unrelated problems,

[1] See chapter on "Measurement of Results."

usually of no special interest, which can all be solved by merely following the rule. This is the ordinary type of problem; it is universal; it serves a good purpose; and there is no reason why it should not endure. It frankly says to a child that it illustrates the process just studied, and the child thereupon solves the problem more or less mechanically. As an illustration it has merit.

Next, there is the so-called *narrative problem*, in which a kind of story is told from problem to problem on a page. This sounds well, but the trouble with the plan is that it usually makes one problem depend upon another, so that if a pupil makes a mistake in one case this vitiates all the following solutions, a very discouraging thing for the child. In this form, therefore, such a series of problems is not a success.

Next, there are *grouped problems*, say a page on one industry, a page on another, and so on. These are usually not dependent on one another, and derive their value over the ordinary type by concentrating on some one occupation, thus adding a little to the pupil's interest and giving some information of general value. Such groups are coming to be somewhat common. They usually have the advantage of reviewing preceding work, not all of the examples referring to any single operation.

Another type consists of problems which seek to place a child in *a real situation* where he must decide for himself, as a result of solving a number of related but independent problems, how he will act. These may relate to his going into business; perhaps as to whether he will do better to leave school now and be an office boy, or go on in school and prepare for some other walk in life; they may relate to the purchase of supplies for a ball team—whether they will be made in a large city department store, with parcel-post rates considered, or be made in some other way; or they may concern a real camping expedition, a real case of a boy's corn club in a rural school, or a genuine case of purchasing home supplies. Such sets of problems are best made by the teacher with the

help of the pupils, but text-books can render valuable assistance by giving types to be followed.

In order that this last type may be better understood at this time, the following set, used by the writer in one of his other works, will serve as an example.

1. Harriet wishes to earn some money. She has learned to bake bread, and her mother suggests that they stop buying bread from the baker, and make their own, Harriet doing the work and receiving what is saved. If flour is worth $5 per barrel of 196 lb., and ⅔ lb. of flour makes a loaf of bread, and we allow $4.12 per barrel of flour for the cost of the other ingredients and fuel, what will it cost per loaf to make the bread?

2. The family uses 2 loaves a day, and the baker's price is 5¢ a loaf. If Harriet bakes the bread, how much is saved every day, and how much does Harriet earn in a year?

3. After a few weeks Harriet gets so that she makes much better bread than the baker, and Mrs. Cook, their neighbor, wishes to buy 8 loaves a week. The bread is so good that she is willing to pay 60¢ a week for the 8 loaves. What are Harriet's profits per week on these sales? What do they amount to in a year?

4. Another neighbor wishes to buy a loaf a day, at the same rate per loaf that Mrs. Cook pays. If Harriet agrees to this, what is her yearly income from this source? What is now her total yearly income from baking bread?

5. Harriet wants to earn $2,200 to pay her four years of college expenses when she is old enough to go, six years from now. How many loaves will she have to bake to save this amount?

6. Her father helps her by adding enough to her savings to put $300 in the bank at the end of each of the six years. If this money draws 4% simple interest, how much will Harriet have at the end of six years?

7. If flour goes up to $6.25 a barrel (196 lb.), or 3½¢ a pound if bought by the pound, how much will Harriet save on 196 lb. of flour in buying by the barrel?

Oral problems can be found in any good oral arithmetic, and such a text-book should be in the hands of all pupils. The teacher will find it very helpful to supplement such work by problems relating to school life, purchases of the home, street life, games and amusements, and the like. In particu-

lar, *problems without numbers* are of great value, for they require thought as to how to proceed to solve a concrete problem, without having the mind concentrated on the actual operation itself. The following are types of such problems, taken from one of the other works of the author:

1. A man buys a certain number of pecks of chestnuts. How do you find how many bushels he buys?

2. Given the length of a sheet and the amount to be added for hemming, how do you find the number of sheets that can be made from a given number of yards of sheeting of the right width?

3. If you know the number of yards of lawn needed to make a skirt, and the price per yard, how do you find the cost of the lawn for a given number of skirts?

4. If you know the number of cups of flour needed for a certain number of loaves of bread, how do you find the number of cups of flour needed for a certain other number of loaves?

5. If you know the price of syrup per quart and also by the gallon can, how will you find the difference in price in buying a certain number of gallons by the quart or by the can?

6. If you know how much water flows through a pipe in a minute, how do you find how much water will flow through it in a whole day, at the same rate?

7. If a boy wishes a piece of board to make a book-shelf, how do you find the cost of the board, knowing the size of the shelf and the cost of the lumber per M?

8. If you know how much iron expands per foot when heated from the ordinary temperature to red heat, how do you find the amount of expansion of an iron rod of a given number of inches of length when heated to red heat?

9. If a salesman sells on a salary plus a certain commission, how do you find the amount of his income for a year?

10. If you know the number of hours per day that a man works, for each day of the week, and his rate of wages per hour, how do you find the amount due at the end of the week?

In general, it may be said that the teacher will do well to make up and have the children make up real problems of local interest, but that not too much time should be taken for such work. It is the province of the text-book to save

time by furnishing enough material to make any great amount of this kind of work unnecessary.

The Question of Rules.—About the close of the third quarter of the nineteenth century, rules had so increased in arithmetic that the work required no thought worthy of the name. Pupils learned rules for everything, and it was supposed to be a mark of understanding to recite glibly one after another. It was a foolish extreme, and the extreme to which the reforms of 1875 went was equally foolish, namely, to abolish rules altogether. The fact is, we all multiply one fraction by another by rule; we may not recite it to ourselves, but we know it and we act accordingly, never stopping for an instant to think out the reason. So there are certain rules that must be learned, whether in book form or not. The great desideratum is that these rules be quickly and naturally developed, so that the child formulates them for himself, thereafter adopting the wording of the text-book if that is clearer and more succinct. No rules at all is as bad as a rule for everything. Modern text-books are reasonable in this matter and may safely be taken as guides.

Pupils' Analyses.—How much attention should be given to the analyses of problems on the part of the pupils, and to their explanations of processes? Formerly there was much more of this work done than is generally the case to-day. When we come to consider the matter carefully, it is seen that the only reason for the requiring of any analysis on the part of the child is that it shows that he understands a particular problem or operation. That he acquires a habit of formal statement that is helpful in other lines of work, or that his memory is strengthened by learning set forms of analysis, has been too often disproved to require argument. To the extent that this analysis is really an explanation of his process there is an unquestionable advantage, since it enables a teacher to commend or improve the pupil's work. But how often is this the case? Indeed, how often should it be expected to be the case? Is it not the general experience

that pupils too often memorize their analyses, and that the teachers commend glib repetitions of their own words or those of the text-book, the matter being so imperfectly comprehended by the child that he is able to bear no questioning?

But does this mean that no explanations are to be given or required? By no means. A child should know, for example, the process of dividing, and he should learn it by a teacher's questioning; he should thereby know that it is reasonable, and he should feel that for the time he understands why he proceeds in the particular way that he does. While the work is being developed he may be questioned as to all this, but that he should long remember the "why" of it all, or that he should be able, at any time that some teacher or supervisor thinks fit, to give a lucid explanation of such a mature process, is as unnatural as it is unscientific.

The Work of Grade V.—In the United States the large feature of the work of Grade V is usually common fractions. Experience shows, however, that there is necessity for a thorough review of the four operations with whole numbers. There are two reasons for this: first, that the child may be certain that he knows these basal operations thoroughly; secondly, because he is now ready to use larger numbers than before, and needs a little exercise in so doing.

As to whether the rest of the work of Grade V should be in common fractions or in decimals does not seem to be very serious. The child already knows something of common fractions and may, therefore, undertake simple work with decimals. On the other hand, the decimal fraction is more abstract than the common fraction; it is historically a much later development; and it more naturally follows the earlier form. If a child is not somewhat familiar with common fractions these should certainly have precedence in Grade V.

Concerning methods of teaching common fractions, there are certain general principles. One of these relates to the question as to whether the child should be able to *explain the*

process or merely be able to perform the operation, "ratiocination, or habituation of the manipulation," as the educator likes to put it. The world seems coming more and more to hold to the common-sense principle that a child should be led to understand a process when it is being taught, but that thereafter the process should become mechanical. For, after all, why should any child of eleven be expected to give the reason for inverting the divisor in the division of fractions? No adult can do it, unless he is a teacher, and even then the reason will probably be quite unscientific. Therefore, we hear much less about children's explanations of such processes than we did some years ago. The principle seems entirely sound.

The second general principle relates to the *scope* of the work. Before the decimal fraction was invented (say about 1600 A. D.) there was some necessity for common fractions with large denominators. That time passed away with the coming of the decimal, and with it went any necessity for the greatest common divisor in reducing fractions to lowest terms. To-day the world almost never has occasion to operate with a fraction whose numerator exceeds eight, although it rather commonly uses fractions with numerators as high as sixty-four in practical measurements. This custom of business would seem to fix limits to the fractions which we teach, a child knowing the significance of fractions up to sixty-fourths, but operating with fractions only as far as eighths. The operation to be emphasized is *multiplication*, for it is a common thing to find the cost of $2\frac{3}{4}$ pounds or $3\frac{3}{8}$ yards of something, but it is a very rare thing to be called upon to divide $2\frac{7}{8}$ by $3\frac{3}{5}$, and it is not very often that we have to add or subtract fractions, particularly if their denominators are any numbers except 2, 4, and 8. It is necessary to teach all the processes, for they are all actually used in business, but it is multiplication that deserves the greatest attention.

The third principle relates to the *use of objects* in the teaching of fractions. It is not limited to fractions, however,

for it relates to all other work in arithmetic as well. The principle is this: Use objects whenever, in developing a rule, they contribute to a clear understanding of the situation, but abandon them the instant they have served their purpose. As to the nature of these objects, the question is not particularly important. Paper folding, paper cutting, inch cubes, blocks of different lengths, fraction charts and disks, figures on the blackboard—all these are helpful, and some variety is desirable. But all of them become harmful after they have served their purpose.

The fourth principle relates to the *form of explanation* to be given. Here any text-book will always supply as good material as the teacher is likely to have from any other source. The little methods of doing this thing or that, which used to be so magnified in classes for teachers, are not now so much in evidence. Any teacher who can read will find a good explanation of the addition of fractions, for example, in the book she is using, and if she will study this and use the common principles of education (which, after all, are mere common sense) in developing it to the class, using objects when necessary, she will get good results if she has the power of getting them.

As to the mathematics of the subject, the above will suffice to show the reader what the problems are and how they can be solved. If we eliminate such fractions as $\frac{2}{3}\frac{4}{3}\frac{7}{7}$, and the requiring a child to explain the operations, which means merely the memorizing of words which signify little to him, the work with fractions offers relatively little difficulty. The reputation that it has for being hard comes from these very two features, and their loss will never be felt except for the better.

In Grade V there is also given, in most cases, some work with compound numbers. Happily this is becoming less prominent from year to year, for it is being recognized that the compound number has to a large extent served its purpose. In ancient times it was found easier to speak of 5

pounds 12 ounces than of $5\frac{3}{4}$ pounds, because people did not know much about working with fractions. But to-day we employ the latter form because every one now knows how to use fractions. Courses of study are, therefore, recommending that but little attention be paid to compound numbers, except in such simple and common cases as feet and inches, and the teacher will do well to carry out the same idea.

In foreign countries but little of the above work is taught in Grade V. The child is supposed to have acquired a sufficient working knowledge of fractions in Grade IV. Therefore decimal fractions are usually taken up in Grade V, together with the necessary parts of percentage. The study of intuitional geometry is almost always begun in this grade, and often some work in proportion is given.

The Work of Grade VI.—In the United States the work of Grade VI usually centres about decimal fractions and the elements of percentage. This is really very little for a year's work, and the reason why teachers find it difficult to cover the ground is that we often find the course burdened with non-essentials. If we accept the principle that the child should be fully informed of the "why" when a subject is presented to him, being placed as far as reasonable in the position of a discoverer, but that he should then be called upon to do the work rather than recite explanations of processes day after day, the ground is easily covered. To add or subtract decimal fractions is merely like adding or subtracting dollars and cents, processes with which the pupil is entirely familiar, and in which his explanations add little to his understanding and nothing to his facility. The multiplication of $\frac{3}{10}$ by $\frac{7}{10}$ should lead without any great amount of talk to the understanding of the rule for 0.3×0.7, and similarly for division. After that the work should become entirely mechanical for the pupil, as it is for us. Certainly there is nothing in this, if presented in a reasonable manner, that makes any great demand upon the pupil's time or energy.

The percentage question is also a simple one, if we consider the essentials of the subject. Of course a teacher who begins by having the children learn the statement that "per cent means by the hundred," a statement quite without meaning to all children and to most teachers, and who then takes up numerous "cases" with their rules, will not find the question simple. But one who takes up the topic in a reasonable way will find that it has few difficulties. In the first place, the pupil must be led to see that $\frac{7}{100}$, 0.07, 7%, all mean exactly the same thing; that sometimes we find it convenient to speak of 18 inches, sometimes of 1 foot 6 inches, and sometimes of ½ yard; and that sometimes we find it better to say 7% than 7 hundredths, though they mean exactly the same thing.

If, now, we remember that about the only practical uses we have for percentage are covered by two very simple cases, we shall be able to give the essentials of the subject without much difficulty. These cases are illustrated by two very simple questions:

1. How much is 6% of $150?
2. $9 is what per cent of $150?

A pupil who can solve these two problems can solve every practical problem in percentage that he is ever likely to meet. Teachers will find that the subject loses much of its difficulty when they concentrate their attention on these two, with the possible addition of another which is related to the second one, namely:

3. $9 is 6% of what number?

With these three a pupil is equipped for any reasonable demand that can be made upon him.

Let us now see how this compares with the work done abroad. In general it is at least a year behind that done in most other countries. What we do in Grade VI is done else-

where in Grade V, and other work besides, and is done thoroughly. In Grade VI most countries complete formal arithmetic, except as it is thereafter reviewed along with the study of algebra and geometry. At least four of the leading European countries begin algebra in this grade. Practically all give a good course in geometry, intuitional rather than formal in character, and in this they introduce work in geometric drawing. Slowly, as our country gets more in sympathy with scholarship and as teachers get better trained, we shall begin to approach this plan. It is true that the school year abroad is a little longer than with us, but this is not the chief reason for the difference.[1]

The Work of Grade VII.—In our country it is a common practice to complete the work in percentage in Grade VII, and take up the most important applications of the subject. Arithmetic now ceases to be mathematical in the United States and becomes merely a branch of elementary civics or sociology. In those applications of percentage, in our American courses of study that are within the range of understanding of the pupils, there is nothing of a mathematical nature that is new, and so the pupil simply marks time. This was not the case under the old régime, for the examples were made so hard as to require some mental exertion in their solution; but these examples were not practical and, properly enough, they were discarded. Nothing of any mathematical content was, however, put in their place. Let us consider, for example, the subject of *taxes*. If we are to teach it at all, and we are compelled to do so under present conditions, we should present it in some such way as this: Some boys in a school wanted to organize a ball team. They found that they could rent a piece of land for a ball field for $4 a month, and that they needed $5.50 at once for balls and bats. Each boy bought his own suit, but they had to raise $9.50 for the first month. They decided that ten boys should

[1] Selections of such phases of higher mathematics as prove valuable tools. —Ed.

be allowed to join, and that each should pay his share, which was 95 cents for the first month. This 95 cents was a *tax* upon each member of the club.

A class wished to buy a picture for the schoolroom. There were 30 pupils in the class, and the picture cost $3.90. Each pupil agreed to pay his share. A committee was appointed, and each member of the class was taxed 13 cents. Here the total tax on the class was $3.90, the *tax* of each pupil was 13 cents, the committee *levied a tax* of 13 cents on each, and a *collector* received the money.

A village needed $8,000 for building a new schoolhouse, and its citizens agreed to raise the amount by a tax. The sum was so large that it would not be fair to make each citizen pay the same amount, so each one was required to pay according to the value of his property. In this way those who had more property were taxed more than those who had little property. A man who owned $10,000 worth of property was required to pay twice as much as one who owned $5,000 worth, and half as much as one who owned $20,000 worth. This is the rule of taxation usually followed by States, cities, villages, and counties.

A county has to pay its share toward the repair of its roads. Every one uses the roads, and so every one ought to pay something toward keeping them in good condition. The county may require each of its voters to pay a tax of $1 or more for this purpose. This is called a *poll tax*, the word "poll" being an old word for "head." Teachers should then have the pupils inquire as to the local tax rate, and should show them a tax notice of the village, city, or town in which they live. They should make clear to them the source of the income to run the school, pay the teachers, light the streets, and so on, so that they may see their own responsibilities and that of their parents.

Now all this is excellent, and since we are compelled to teach taxes in arithmetic, this should be the spirit of our work—but let us understand clearly that it is civics, eco-

Motivated arithmetic work in Boston public schools

nomics, or sociology—not mathematics. The mathematics in the subjects of taxes, insurance, commission, brokerage, profit and loss, banking, and various other applications of percentage, *as taught at present in our schools*, is puerile. If the tax rate is 7 mills on $1, how much is it on $10,000? At $1.25 per thousand, how much does it cost to insure a house for $5,000? Such problems are, mathematically considered, the work of pupils in Grade V. They are perfectly proper as problems in economics, civics, and sociology, and every child should meet them, but they have no place as mathematics in Grade VII, and in the long run this will be recognized, although we are forced by circumstances to give them this place at the present time. So long as this compulsion exists, it is our duty to see that these subjects are taught in the spirit above mentioned, but with the advent of the junior high school it is probable that the time allotted to arithmetic in Grades VII and VIII will be reduced and some definite work will be given in intuitional geometry and the algebra of the formula. See our last paragraph on this point.

Simple Interest.—The subject of simple interest offers, however, a field in which mathematical reasoning is involved to some extent, and in which there is much drill in practical multiplication and division. Nevertheless it must be said that here, too, the mathematics is becoming very attenuated, and will probably not long survive. People now borrow money at banks; the terms of credit are usually 30 days, 60 days, or 90 days; the principal is usually some such even amount as $100, $500, $1,000, or the like; the rate is usually 6% or 5%; and the interest is computed by the use of tables. The mathematics involved is slight. Fifty years ago a man who owed his grocer $78.30 would give a note due on some convenient date, and it would be a practical problem to find the difference in time, and then to find the interest on $78.30 for 5 months 22 days at 7%. Such a problem to-day is practically obsolete so far as the experience of the great mass of our people is concerned. Partial payments on notes is also

passing away as a business custom. To the next generation the mathematics of simple interest will be very slight.

What has been done in other countries to furnish material of mathematical content for this grade? Practically everywhere is intuitional geometry taught, even including locus problems. In all other countries the simple (linear) equation in one unknown quantity is taught in this grade, and with this often go graphs and factoring. Algebra is made much more real than our arithmetic, and this is done by showing the practical and extensive value of the formula and the graph. Geometric drawing is very common; arithmetic is briefly reviewed, and the entire work has a mathematical content which ours entirely lacks. With departmental teaching of mathematics we may hope for work of this kind in America; under any other plan it would be a failure.

The Work of Grade VIII.—What has been said with respect to Grade VII holds equally true with respect to Grade VIII. The work as it now stands is chiefly in the important fields of civics, economics, and social affairs, but hardly at all in the field of mathematics. Formerly there were taught in Grade VIII such subjects as square and cube root, progressions, alligation, equation of payments, and simple and compound proportion. These had mathematical content, but they were not related to the life of any pupil or to the interests of the majority; they had served their purpose at a time when arithmetic of this kind was taught to an older and more carefully selected lot of pupils, and when certain of these topics had more practical significance; but their day has passed. Their elimination left a gap which had to be filled, and this was done with no reference whatever to mathematics, but solely with reference to the other subjects mentioned. Much of the material is valuable, but not from any mathematical consideration.

We are, then, confronted by this condition in Grade VIII: we must either teach civics and economics, with a little sociology, all involving merely the mathematics that can

easily be covered in Grades I–V; or we must follow the lead of other countries and teach some real mathematics. The latter alternative necessitates departmental teaching, the high-school department taking over grades VII and VIII. Such a change cannot be made at once, however; indeed, it will be many years before we can get enough teachers to do work of this kind, and it will require another generation of school administrators with greater desire themselves to add to the world's fund of scholarship. At present, all that can be done is to teach civics in arithmetic as well as possible, or to put grades VII and VIII into the Junior High School, with departmental teaching and a richer curriculum.

How, then, shall we go about to teach the subjects of Grade VIII? Experience shows that we do best to dramatize the situations as far as this is possible. Every boy and girl should know the meaning of a corporation, for this is the age of corporations; the children should know the large features of such organizations, what is meant by directors and officers, and by stocks and bonds. To this end they should organize a corporation and play the game. This may be done in some such way as this: Some boys in the eighth grade have organized a ball club. There are fourteen boys and they pay $100 for uniforms and $12 for balls and bats. If each of the boys should contribute ¼ of $112, he would contribute $8, and if the team made some money from tickets to the games, each boy would have ¼ of the profits after the expenses were paid.

But some of the boys cannot afford to contribute as much as others, so they divide the $112 into 224 shares of 50 cents each, and sell to the members as many shares as they care to buy.

James is one of the chief promoters of the club, and he takes 40 shares, thus making his payment $20. Fred takes 20 shares, and the rest take various amounts.

The first three games draw large crowds, and the gate receipts are heavy. The boys divide the profits according to

the number of shares they hold. Fred tries to buy some of the shares that James owns, so as to get more of the profits, but James will not sell for less than 60 cents a share. He says his stock is now *above par.*

The boys really formed a corporation. The *capital* was $112. There were 224 *shares of stock*, the *par value* of each being 50 cents. The profits they divided were *dividends*, and these dividends were so high that the stock went above par.

In practical life men form corporations in this way, only they play the game of business instead of ball.

It is not possible, in the space allowed to this chapter, to give further suggestions with respect to details of the course. In general, however, a pupil should be placed in a position to use his judgment with respect to the mathematics of a definite situation in which he may find himself. In a rural school it should be with respect to laying out and measuring fields, fertilizing the soil, the nature and value of crops, putting up fences and farm buildings, draining, balanced rations, taxes, and farm and household economics. In the city the range of subjects is equally broad, including the local industries, home economics, street life, amusements, and civic expenditures. The following are examples selected from the author's other works, which show what is meant by the real-situation problem adapted to this grade:

Thrift in the Home

1. Mrs. Brown finds that she can save at least 50¢ a week by going to the market and buying in person. By doing this she will save how much a year, at least?

2. Frank gets interested in the idea of helping to cut down the high cost of living. He says he will raise vegetables. Allowing $1.25 for ploughing, $3.25 for fertilizer, $1.30 for seed, and 75¢ a week for 22 wk., which wages his mother insists that he shall have for his bank, what are the total expenses for the season's vegetables?

3. Mrs. Brown used to spend $54 for these same vegetables at the store. What was the saving in having their own garden?

4. Since Frank's mother no longer buys over the telephone, she decides to cut off that expense. This comes to $2.25 a month. How much does she save in a year by not using the telephone?

5. Frank notices that at certain times there are bargain sales at the stores. By buying at a sale, an $18 suit at 15% off, three $1.50 shirts at 10% off, a dozen 25-cent handkerchiefs at 16⅔% off, a pair of $4.75 shoes at 25% off, and a hat and some collars and ties amounting to $5.35 at 20% off, how much does he save in all on the purchases in Exs. 1–5?

6. How much have Frank and his mother together saved as stated above?

7. They find that they can invest this money at 5% interest. What will it amount to in 10 yr.?

8. At the end of a year after the investment mentioned in Ex. 7 was made, they invest an equal amount again at 5% interest, and they do this every year until the end of the 10 yr. How much will they have at the end of that time, including the interest?

9. Frank will then be old enough to go to college. His mother says that he will need $1,500 if he is studious enough to earn a free scholarship. Will they have money enough saved to allow Frank to go to college? If not, how much must Frank's father contribute to help them out?

How Tom Earned His Spending-Money

1. Tom's father gives him his choice of 35¢ for spending-money a week, or a dozen hens with which to earn what he can. How much would 35¢ a week amount to in a year? If the hens laid 100 eggs apiece in a year and eggs averaged 28¢ a dozen, how much more would Tom have for spending-money by keeping hens?

2. Tom figured this out, but forgot to deduct the expense of feeding the chickens. Suppose this to be $1 per year for each hen, and suppose that the hens averaged 125 eggs apiece, how much better would Tom's annual income be than 35¢ a week?

3. Tom chooses the hens and keeps a record of income and expenses. He finds that there are more table scraps than he had counted on, so that he needs each week only 1 pk. of corn costing 60¢ a bushel, ½ pk. of oats costing 36¢ a bushel, and 5 lb. of bran costing $1.40 per 100 lb. What is the expense of the feed per year?

4. During the year the hens averaged 2¼ doz. eggs a week, and these he sold at an average price of 25¢ a dozen. What is his income per year? Deducting his expenses, does this leave him more than or less than 35¢ a week, and how much for the year?

5. Tom wishes to make more money. He learns that by selling eggs for hatching purposes in the late winter and early spring he can get 75¢ for a setting of 15 eggs. If he sells 20 doz. at this price, how much does it add to his yearly income? What does this make his average income per week?

6. He finds that his friend Dick keeps bees, getting 33 lb. of honey a year from each hive. Dick has four hives, and he sells the honey for 18¢ a pound. Is he doing better or worse than Tom, and how much per week?

7. Tom decides to add bees to his source of income. If he can buy two hives of Italian bees for $4.25 a hive, and needs in addition $1.80 worth of supplies, how many weeks will he have to save his income as found in Ex. 5 in order to pay for the bees and supplies?

SUMMARY

1. The problem of teaching the essentials of arithmetic is not one of special difficulty.
2. The curriculum in arithmetic in the primary grades, determined by world experience, is more uniform than is generally thought to be the case.
3. There is no single narrow method which will make every one a good teacher of arithmetic.
4. Our American schools begin to fall behind those of other countries, with respect to the content of mathematics, at about the beginning of the fifth school year, and at the end of the twelfth school year they are a year or so behind.
5. Much of the difficulty in arithmetic can be removed by confining the work to the essentials and by having scientific supervision of the study periods.
6. Some form of standardized tests in arithmetic is valuable in assuring the teacher that the work is fairly up to the average of other schools.
7. There are various types of problems, each of which has its value, and the teacher should recognize the value of each, and not confine the work to any one type.
8. A pupil's memorized analysis of a problem or of an operation is of relatively little value.
9. The prime object in elementary calculation is intelligently to secure an accurate result, and to do this in a reasonably short time, but accuracy is much more important than speed.
10. The work in the seventh and eighth school years should relate chiefly to business arithmetic, but with the advent of the

junior high schools we shall probably fall in line with the rest of the world and add some definite work in intuitional geometry in Grade VII, and some definite work in practical algebra in Grade VIII.

PROJECTS IN APPLICATION

1. Make a list of sixteen examples in the four fundamental operations with (*a*) integers, (*b*) common fractions, (*c*) mixed numbers, (*d*) decimals which represent, to your mind, the hardest work that any school child should be called upon to do in order to be prepared for ordinary business life.
2. Make a list of such applications of percentage to business needs as you feel a pupil should know, and which involve enough arithmetic to make them worth while.
3. Make a list of number games which you feel can profitably be used in the first two school years.
4. Write out a list of topics which you feel should be thoroughly covered in the arithmetic of the first four school years, and in the order in which you feel they should be taken up. Express your opinion as to the advantages of the well-ordered arrangement of matter over presenting the work with no system of arrangement on any basis of psychology or arithmetical sequence.
5. Write three problems which you feel would appeal to the interests of children in connection with the teaching of long division, and three in connection with the teaching of the multiplication of a fraction by a fraction.
6. Write a set of ten examples which you could use in testing the accuracy and speed of children in arithmetic at the close of Grade IV. Write your estimate of the time that should be taken for the test, and, if possible, test your judgment by assigning the examples to a class. Acquaint yourself with the Courtis tests in arithmetic.
7. What arguments can you bring in favor of or against teaching algebra and geometry in the seventh and eighth grades, say in a junior high school.
8. To what extent should mathematics be taught in connection with occupational activities which require its use as a tool?
9. Report on Monroe and Wilson's studies in the Sixteenth Year Book of the National Society for the Study of Education.
10. What knowledge is of most worth in arithmetic?

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CHAPTER XI

HOUSEHOLD ARTS

Preliminary Problems

1. What do I, an adult, know of the processes involved in the growth, production, manufacture, and preservation of the foods that appear daily on my table?
2. Why did my great-grandparents understand the fundamental processes which underlie the industries related to our home life?
3. To what extent are the children of to-day acquiring this information as a part of their general education?
4. How can this body of vital material be introduced into an apparently overcrowded curriculum?
5. What are the household arts?
6. What are the elements in modern life which make it necessary to supplement home training by introducing household arts into the upper elementary school?
7. In what way will the home life of the community and the general aims of the school in which I teach regulate the selection of subject matter in the household arts course?
8. What are the fundamental problems in the home life in our school neighborhood which should serve as a basis for organizing this subject matter into a course of study?
9. What criticisms can you make of the ordinary instruction in household arts in elementary schools?

I. General Survey of Household Arts

Why the Industrial and Household Arts Should be Found in the School Curriculum.—The dust on the spinning-wheel, the rusty condition of the candle-moulds, and the countless other symbols of bygone days now resting in the attics of our grandmothers are responsible for the present-day status of the industrial and household arts in the elementary school.

The home life of the child of to-day offers a minimum education in the sources of food, clothing, and shelter. His knowledge of his life necessities is limited to the simple operations which furnish him with material comforts. Press the button and the room is flooded with light; a telephone message brings the daily rations, in many cases prepared for service; a mail-order or a shopping expedition equips the child with the season's clothing; a house hunt determines his home for the following year.

Great economic and social changes during the past century have taken from the home many chances for the child to learn the "how" and "why" of simple home and industrial processes. The factory, with its huge daily output, has supplanted innumerable home activities; and with this change the education of the girl and boy has suffered. Industry and machinery have taken from the child's experience the former opportunity of learning from the father and mother, as all worked together at their tasks. As a result of these radical changes, there have entered into the curriculum of the elementary school the industrial and household-arts subjects which by their very presence enliven and unify those already existent.

Their Place in the Curriculum.—The subjects of industrial and household arts in the elementary school naturally divide into two time divisions:

(*a*) Grades 1–5 or 1–6 inclusive, during which period the boys' and girls' work is not diversified, save as the problems selected are adapted to their special interests in Grades 5 and 6.

(*b*) Grades 6, 7, and 8, or Grades 7 and 8, during which period separate lines of work for boys and girls are established. In some school systems the seventh and eighth grades form the first two years of the junior high school. (There is a strong tendency to-day to meet common demands made upon both men and women as consumers by giving girls short courses in the shops, and boys a series of lessons in the household-arts laboratories.)

Aims.—The aims of all industrial and household-arts work in the elementary school may be stated as follows:

1. To create a clear understanding of the processes which support our daily lives.

2. To establish through accurate manipulation of materials in true industrial processes an appreciative understanding of the labor involved in the manufacture of various products, and a respect for that labor.

3. To develop skill and technic in the handling of foodstuffs, textiles, woods, metals, clays and other allied earth materials, in accordance with the powers of the child.

Although a degree of skill commensurate with the ability of the child is essential in the lower elementary school work, the guiding principle of the industrial and household arts in this field is one of appreciation and understanding. In the suggestive work as outlined for the second grade later in the chapter, the making of furniture, bedding, and table-linen was taught, not specifically for the purpose of training the child in these processes, but

1. In order that the work of the cabinetmaker and the home-maker may be understood through the doing, and

2. In order that the characteristics of the materials handled may be understood.

On the other hand, in the upper elementary school work, definite skill and technic in handling materials and securing results, paralleled by an intelligent insight into economics and elementary science and social connections, form the basic underlying principles.

Teachers.—In the lower elementary school the ideal situation provides the *supervisor of industrial and household arts* who is trained in the processes and who appreciates the value of his subject as a means toward an end, not as an end in itself; and *a classroom teacher* who, through training and adaptability, is equipped to teach all subjects in her grade, including industrial and household arts, and who through a keen appreciation of the needs of the child will establish

vital connections whenever possible among the various subjects. It is impossible to overemphasize correct standards in all industrial and household processes throughout the elementary school, for early habits and concepts must essentially "ring true" in order to build the superstructure well.

The household-arts work of the upper elementary school, or, as it is known in some schools, the junior high school, should be handled by the specialist, who may also be the supervisor of household-arts work in the lower grades. The nature of the subject demands a woman who has an optimistic, adaptable personality, and a love for home interests and ideals. She must have a keen appreciation of relative values and the ability to blend subject matter, placing emphasis where emphasis is needed.

Suggestions for Equipment.—It may be said that the old adage, "where there's a will there's a way," proves true in the household-arts work in the elementary school. All the way from the one-room rural school, with its large heating-stove, to the well-equipped modern school-building, the opportunities for introducing the problems of the home are constantly present. The work as planned must, to be sure, meet the exigencies of the situation. The school luncheon may offer the initial opportunity in the work in foods. The classroom curtains and other furnishings may be the "entering wedge" in sewing. The care of the room will offer a vital problem in cleaning and sanitation. Co-operation in beautifying and caring for the school-building and school-gardens will form a basis for lessons in home-making.

The famous cooks in the neighborhood may be delighted to show the children how to make their "specialties," and a visit to their well-kept homes will be a living example of household efficiency.

The ordinary classroom, with a few borrowed utensils, will enable the teacher to show her class how the flour which they have been studying in connection with the wheat industry is finally made into bread; and this same bread may be

baked by the children in the borrowed oven, in the kitchen next door or across the road.

But let us sanction such emergencies only as a beginning, or as an adjunct to work done with a better equipment in the classroom or special laboratory. The board of education or school directors may need tangible evidence before voting to spend any money for equipment. As a means of showing its true worth as a school subject, the emergency equipment or the "open house" of the neighbor will furnish a means of approach. Furthermore, some co-operative money-making by pupils and teacher for purchasing equipment through sales of simple food and textile products may inspire the respect and appreciation of the "powers that be" and result in the necessary appropriation.

Equipment for *individual* or *group* projects in food preparation may be purchased, dependent upon the opportunity for use. A combination of both is desirable in order to give opportunity for independent manipulation, as well as the normal home problem.

Opportunities for introducing the teaching of sanitation into any school-building will be apparent. It must be a constant in the teaching field, and innumerable lessons will present themselves to the wide-awake teacher. Fortunate, indeed, is the teacher who has access to typical home rooms in the planning of these lessons.

Emergency tables in the classroom will serve many purposes in the teaching of household arts. From the low kindergarten table to the special table for use in the cutting of garments and the commercial-laboratory table for food preparation, there are several intermediate steps. The large wooden table tops which may be placed over the desks or on wooden horses, or swung as shelves against the walls of the room, are easily stored, and are very satisfactory for teaching in either field. The ordinary kitchen table may be covered with zinc or oil-cloth if desired, and will serve well for the work in foods.

The sewing-machines in the homes of the children may meet the need for machine work, with a demonstration and practice lesson in one home. Co-operation of the women's philanthropic organizations is desirable. This may solve the problem of materials, and give opportunity for machine practice.

Individual sewing equipment may be supplied by the home, but the economy in the purchase of these materials in quantity is evident.

Packing-Box Equipment.—As a suggestion for the teacher in the rural school, the packing-box equipment may prove an inspiration. Two ordinary packing-boxes, stained, with shelves built in, top covered with zinc, and each box fitted with curtains on double rods (to exclude dust), serve the double purpose of cupboard and work-table. Well-adjusted hooks for dish-pan and rinsing-pan, wire towel-rack, blue-flame kerosene-stove, and portable oven—and the setting is complete for serious work in food preparation. Small kerosene-stoves (for individual work) may be added. The utensils may be selected as needed.

In this brief consideration of equipment possibilities the difficult situation has been considered, as a means of showing that the work in household arts is *not impossible* under such conditions; but that the more complete and ideal the equipment the more vital and practical can the work be made.[1]

The Real Home as a Laboratory.—With the progress of events in the educational field has come the real home as the laboratory for household-arts teaching. This home must meet, so far as possible, the home conditions of the children. Ideally, a typical family should live in the home, whose concrete problems will vitalize all phases of household-arts work. The selection of the home, its decoration and furnishing, its care, the economics and preparation of clothing and food

[1] Further help in planning equipment can be secured in "Equipment for Teaching Domestic Science" (illustrated), by Helen Kinne, and "Domestic Art in Woman's Education," by Anna M. Cooley, chap. VI.

for the family, and the social responsibilities of the various members of the household within the home and in the community may be woven into a very practical unit of study. The reality of such a course guarantees its success under the direction of the skilful teacher.[1]

The growing number of consolidated farm schools offer excellent opportunities when each principal lives in a house built on the farm as a part of the school plant.

II. Suggestions for Household-Arts Phases of Industries in the Lower Grades

Point of Contact.—The illustrations of the cartoonist that picture the child sitting in the schoolroom gazing longingly through the window at real life should be suggestive to all teachers. The children in the first and second grades are, of course, most of all interested in their homes, in their mothers, fathers, sisters, and brothers. It is through this interest that the real work of these grades may wisely be attacked.[2]

The following work done by a second-grade class is a unit that is suggestive of the connections that can be made by the versatile teacher between the subject matter that she thinks the children should be taught and the many attractions of real living. A little home in the schoolroom was the means of giving real motive to a variety of school subjects.

I. *Food.*—(Details omitted.)

II. *Shelter.*

1. Making a simple house form with a frame of wood covered with burlap, containing a door and window, using mica for window-panes; the top or roof is left open; the parts are in panels and are easily folded; the wall of the classroom may be used as one side of the house.

[1] This home-school idea has been very successfully developed by several teachers of upper elementary and high school work. The writers will be glad to furnish further information upon request.

[2] Quoted from Grade 2, "Speyer School Curriculum, 1913," page 46, 50 cents.

2. Furniture for the house table, chairs, buffet, bed, bureau, and bookcase—made in simple style of wood by screw construction; each piece is made by two or more children working together.

3. Housewifery, using the house and furniture made. (*a*) Care of dining-room: sweeping, dusting, setting of table, washing dishes, laundering linen. (*b*) Care of bedroom: sweeping, dusting, making of bed, laundering of bed-linen.

III. *Clothing.*

1. ————

2. Dust-cloth: individual towel basting, running, overhanding; iron holder; Christmas-stocking basting or running and blanket-stitches; room furnishings—bedding, table-cloth, napkins, curtains; needle-case.

3. ————

4. ————

IV. *Utensils.*

1. ————

2. Clay dishes made for the dining-table in the house. Tiles.

The geography, number work, writing, and spelling that can be found necessary in planning and making the furniture may be realized after reading the following chapter on "Industrial Arts." Only the household arts growing out of the house problem will be discussed here.

Elementary Study of Textiles.—The first questions to be solved were: "Of what shall we make our blanket, table-cloth, bureau scarf, mattress, etc.?" This necessitated learning the conspicuous differences between cotton, linen, silk, and wool. Children can, of course, make only a beginning in such work, but by handling various pieces they can recognize those that are typical. The teacher must avoid making the problem too difficult. The choice of color was a problem in art work.

Correlation with Number Work.—Taking measures for the table-linen, bedding, curtains, etc., and allowing for hems of various widths gave material for problems in number work that had to be solved before the material could be cut into.

Embroidery class at the School of Household Industries, Manila, P. I.

Class in sewing in our great educational experiment across the Pacific.
Bureau of Education, Manila, P. I.

Small Children Should Work with Coarse Materials.—The teacher should choose materials for the hand-work itself that are adapted to the age and capacity of the children. Soft, loosely woven cloth, unstarched, number six needles and number fifty cotton thread, will tend to make the work easier and results more satisfactory. (The children's individual equipment may be in boxes labelled with the names, kept in the desks or on the closet shelf.) The cutting out of the work cannot be expected of the little folks. Girls in the seventh or eighth grades learn a great deal by preparing such work for the lower-grade children and, when possible, in helping the teacher during the work periods.

Devices for Class Presentation.—The feasibility of teaching a problem apparently so complicated depends entirely upon the unifying of the problems. All articles to be hemmed were considered together and assigned to the different children according to their respective ability. The holding of the work, measuring of hems, basting, and running were each taught to the whole class at one time by using a large piece of cloth representing a specific article and demonstrating each step slowly and plainly. For showing how to pin, large pins were used; for sewing, a huge darning-needle threaded with brightly colored Germantown yarn. The stitches made very large were really only diagrammatic. The cloth left hanging on the wall, showing some completed stitches and the needle in position, blackboard sketches, and samples showing the stitches properly made on material such as the children were using—all were needed to help the children understand how the work should be done.

The reader may wonder at the use of the running stitch instead of hemming. The hemming stitch is very hard for little children. Even children in the fourth grade find it difficult when they first learn it. The blanket-stitch was reviewed and served as a satisfactory finish for the articles needing unturned edges. The pillow and mattress needed a strong stitch, overhanding, a simple one to learn.

Laundry Work.—When the articles were completed the table and bed linen needed laundering before using. That each child might wash one piece, some washed their individual towels. Several pans of water in the schoolroom, small heated flat-irons, and improvised ironing-boards completed the necessary equipment. The drying of the clothes had to be done on the roof.

Housekeeping.—The housekeeping was a pleasure that, after the first real lessons in bed-making, sweeping, dusting, etc., had to be divided up by separating the class into families of four, each to hold his place as father, mother, boy, or girl for one week. The daily 10.30 milk-and-cracker luncheon supplied practice in simple table-setting and table etiquette. The family in each case enjoyed the privilege of using the dining-room, while the rest ate as usual on their desks.

Toward the end of the year the sixth-grade class in the school gratified a longing of the families for some sort of floor covering by presenting a rug made on the Colonial loom, in connection with a study of the way in which design is produced in cloth.

A Unit of Work in Grade 5.—The household-arts phases of the work taught in the fifth grade in the same school show the widening interest that may be expected of a child of ten or eleven years, in contrast to the play home that is the natural point of contact for the primary children.

I. *Foods.*—Subject matter:

1. Cereals: Production, in relation to geography, nature study; manufacture of cereals: (*a*) Flour and corn-meal. Milling industries, use of flour in bread-making—study of yeast, relative cost and wholesomeness of baker's bread and home-made bread; corn-meal in griddle-cakes, study of gluten. (*b*) Breakfast foods—preparation and food value. (*c*) Other products—starch, glucose, corn-syrup, etc.

2. Meats: Stock-raising, in relation to geography; stock-yards and packing-houses; cold storage of meats; government inspection; meat cuts, relative prices, and food values; preparation of meat—boiling, broiling, roasting, frying; soup-stock.

3. Sugar: Food value, manufacture of beet-sugar, maple-sugar, and maple-syrup adulterations.

4. Sherbet and ice-cream: A study of the principles of refrigeration; food values.

5. Market-gardening in relation to nature study—supplying fresh vegetables to New York markets.

6. By-products of food—fertilizer, button, and other bone products, glue, horn products, corn products.

7. Spices.

Projects:

1. Grinding wheat and corn to flour and meal. Testing for gluten. Yeast bread. Griddle-cakes and maple-syrup. Breakfast foods.

2. Boiling meat. Soup-stock and soups.

3. Beet-sugar.

4. Sherbet and ice-cream.

5. Visit to market to study meat cuts, prices, and methods of handling vegetables.

II. *Shelter.*—(Details omitted.)

III. *Clothing.*—Subject matter:

1. Cotton: Production, plantation life; ginning by hand and machinery; story of Eli Whitney and the cotton-gin; cotton as compared with other textiles in price, suitability for clothing, etc.; charts showing the cotton industry.

2. Milling: Study of textile mills of New England and the South in connection with geography; mill life; machinery and influence upon workmen; child-labor problems.

3. Garment-making industries: Factory and piece-work. Cost of ready-made clothing. Sweat-shops and Consumers' League.

4. The sheep-ranch in relation to geography.

5. Garment construction: Aprons, stitches—basting, running, hemming, French seams.

6. Clothing budget of a fifth-grade child for a year.

7. Repairing: Sewing on buttons, patching of flat article.

8. Shoes.

Projects:

1. Cotton charts.

5. Garment-making data; apron.

6. Budget of child's clothes.

7. Patching; sewing on buttons.

8. Charts of the shoe industry.

(Quoted from "Speyer School Curriculum, 1913.")

Foods.—The outline under "Foods" speaks for itself. The lessons were frequently taught in the school kitchen, but with substitutions and few changes the same lessons could have been taught in other rooms. The practical work in connection with the beet-sugar industry consisted in the cooking of chopped beets, draining out the beets and finally boiling down the liquor. The taste of the water is convincing.

Clothing.—The making of charts under clothing may need explanation. Loose-leaved books were made by the children. On these pages were mounted illustrations of boys or girls of the age of fifth-grade children.

Chart-Making.—Materials suited to the individual garments were mounted in order in the book. Careful cutting, pasting, and placing on the page, definite consideration being given to color combinations, made an attractive result. Co-operative charts made to hang on the wall can tell the stories of cotton, linen, or other textile production, transportation, and manufacture much more graphically than discussion alone. Each child's interest in adding contributions to the whole tends to make the problem vital. Free use of pictures, stereoscope, and lantern-slides helps to form correct mental pictures.

Holding the Boy's Interest.—The boys in the fifth grade are naturally not vitally interested in hand-sewing. Beyond the point of sewing on buttons, mending balls or tents, it is rather difficult for the teacher. Making of work aprons by hand for shop or kitchen and, in connection, a study of the garment-making industry in New York City helped the boys to realize the importance of the sewing-machine. An appreciation of labor involved, dangers of sweat-shop work, the injustice of the low rates on piece-work ought to lay foundations for a democratic social attitude.

Arithmetic.—The arithmetic of the grade was given practical application by various calculations in connection with the industry in New York City.

III. Household Arts in the Upper Elementary School

Planning the Course of Study in Household Arts for the Upper Elementary School.—With the home and its manifold problems as the source of subject matter, the responsibility for the selection of material suited to the needs of the children in the upper elementary school lies with the teacher. A survey of sanitary, economic, social, and spiritual home conditions of the neighborhood must help to determine the problems to be selected in this work. Close correlation with the work of the grade and an insight into the present interests and future prospects of the girls must parallel this survey.

Suggested Questions in Survey.—A few suggestive questions for use in investigation follow:

What is the average income of the families of these girls?

Are their homes fitted with modern plumbing?

What is the water-supply for these homes?

Have they any connection with a sewage system? If not, what are the sanitary conditions about the homes?

To what extent has the property been kept in repair?

What is the fuel used?

What is the attitude of the family toward

(*a*) House furnishings?

(*b*) Attractive meal service?

(*c*) Taste in dress?

(*d*) Fresh air?

(*e*) Flies?

To what extent do the individual families feel a responsibility for the welfare of the neighborhood?

To what extent do ideal family relations exist?

Does the present generation understand and appreciate the work accomplished by parents and grandparents?

In what way are the foods used by this community influenced by nationality and creed?

Need for Specific Adaptation to Community and Individual Homes.—Although there are many problems common

to all homes, each course of study as planned must reflect the interests and the home life of the specific community in which it is to be taught. *Live problems* must form the basis for the course of study; and surely in this day of economic pressure, it will be the most natural thing in the world for the children to feel the need of solving the problems of their own homes.

In addition to the worth-while problem, the course of study must evidence continuity of thought, gradation in manipulative processes, development and application of working principles, relation to other class work, interests, and unity of the whole.

The Household-Arts Work as a Bond Between Home and School.—As a means of unifying home and school, this subject is very valuable. Every opportunity for strengthening this bond should be cherished. In the case of limited school equipment, much valuable work may be done through home practice, supervised by the teacher and followed by reports and comparison of products.

Co-operation with the School Lunch-Room.—Co-operation between the department of household arts and the school lunch-room provides increased opportunity for making the work of the upper elementary school practical. It is necessary to exercise judgment in developing such a scheme. If the demands of the lunch-room are allowed to regulate the lessons taught, there is danger of limiting the educational value of the subject. On the other hand, the utilization in the lunch-room of the products prepared in the class in cooking results (1) in the use of family recipes in place of the very small quantity, (2) standardized products, and (3) an opportunity for occasional repetition of processes for the purpose of attaining skill.

IV. Suggestions for Course of Study in the Upper Elementary School

Suggestive Course of Study in Household Arts for the Upper Elementary School.—The following course of study is similar in nature to one which has been worked out in a school in a large city. The time allowance is three hours a week; but at certain times, when the course requires it, extra time is granted for excursions and discussions. This is considered legitimate, because of the close correlation with the work in history, geography, and mathematics which gain strength through such readjustments.

Scope of Work in the Upper Elementary School.—Every effort has been made to establish problems which represent the existing ones in the homes of the children; and in solving them constant application is made to the individual home. The consecutive two-year course includes a study of the following home activities:

1. Choice, making, and care of clothing.
2. Furnishing and care of home.
3. Buying, preparation, and service of foods.
4. Personal and civic hygiene and sanitation.
5. Elementary economics of the household.
6. Varied needs of different members of the family.
7. Home ideals.

Economics of the Home an Important Factor.—Especial emphasis is laid throughout the course upon economy in the management of the home. A family of five is made the basis of calculation.

Importance of Seeing Things "At First Hand."—Excursions to bakeries, mills, museums, exhibits, shops, markets, and well-ordered homes are strongly recommended. As a substitute for the real, in case such excursions are impossible, the stereopticon, reflectoscope, stereoscope, and moving-picture films are not "just as good," but have an educational value.

Vocational Guidance One of the Household-Arts Teacher's Responsibilities.—In addition to training the girl in the art and science of home-making, the teacher of the household arts has as one of her sacred responsibilities the chance to help in the formation of the future plans of her girls. Through her guidance a girl may eventually enter a field which is suited to her needs and interests. The elementary school teacher may be able to lengthen the school life of the girl by helping her to plan a satisfactory high school course.

An earnest twofold study is necessary for this:

1. An appreciation and understanding of vocations open to girls.

2. A sympathetic and intelligent study of the girl, her interests and her capabilities.

Furthermore, opportunities for earning money present themselves to the girl who is able to assist in household activities. The alert teacher will serve as a medium for bringing to her girls these opportunities as a field for practical experience.

SUGGESTED COURSE FOR GRADE 7

Problems for the Year

"How can I help to share my father's and mother's responsibilities in our home?"

(During the first half-year emphasis is laid upon learning how to handle tools, utensils, and materials accurately and skilfully, and acquiring a working knowledge of simple, basic processes.)

Hand-Sewing.—"I must learn to make small, dainty articles before I try to make dresses." *Apron, dust-cap, or similar article* serves as a review of stitches in hand-sewing. Ample time devoted to selection of materials, learning names and values of the various materials suitable.

Crocheting.—Crocheting of

I. "Why is meal-planning an important part of housekeeping?"

(*a*) "What are the foodstuffs which the body needs?"

(*b*) "What foods will give us these foodstuffs?" (Simple classification of foods.)

(*c*) "How must they be cooked so as to be attractive and digestible?"

coarse linen lace to be used later in Christmas gifts. After the difficulties of learning are over, the lace can be finished at home during December.

Note.—It is urged that every lesson include simple, attractive service of the dish prepared; a white paper napkin and the necessary serving-dish and silver may be daintily arranged at the child's place or on another table, as conditions allow.

A. Series of lessons on preparation of dishes suitable for *luncheon*, emphasizing method of cooking foods containing carbohydrates. Final lessons, planning and serving of luncheon at stated cost, class making market list and doing buying.

SUGGESTED SERIES

Lesson 1. Prepare sandwiches; serve with milk.

Classify foods used in sandwiches as containing carbohydrates, protein, mineral matter, and fat.

Lesson 2. Prepare creamed dried beef; serve with bread and butter and apple.

Note.—These two lessons are suggested as opportunities for the noon luncheon, in order that the teacher may get acquainted with table manners and customs of children.

Lesson 3. Cookery of vegetables.

Lesson 4. Chocolate blanc mange.

Lesson 5. Cookery of dried fruits.

Lesson 6. Plan luncheon for 10 c. per person, make market list, discuss simple home service.

Lesson 7. Serve luncheon to

CHRISTMAS WORK

Repair of Clothing.—1. Articles of used clothing may be solicited by the children from their friends to be used as gifts to the poor in the neighborhood. Putting these into good condition requires sewing on of various kinds of buttons, hand and machine hemmed patches, stocking-darning, and a general going-over of all the garments.

Cleansing of Clothing.—One or more lessons devoted to cleansing, brushing out of doors, removal of common spots on woollen clothing, pressing.

2. *Linen vs. Cotton.*—Making of Christmas gift, using crocheted lace. Suggestions: bureau scarf, neckwear, doily, or pin-cushion. The selection of material brings in a comparison involving distinctions, prices of each, and suitability to the specific use.

Garment-Making by Machine.—*Practice on machine* (one lesson).

members of the class, with one or two very informal guests.

B. Breakfast series (continuing carbohydrate cookery), including:

1. Cereal cookery.
2. Preparation of fresh fruit.
3. Making of cocoa.
4. Making of toast (plain and French).
5. Planning and serving of breakfast.

Thanksgiving Lesson.—Making of cranberry jelly for hospital.

CHRISTMAS PROBLEM

"What can we do to make Christmas happy for the needy in the neighborhood as well as for my own family and friends?"

1. Make steamed berry puddings which may be sent out into the neighborhood, with directions for making and freshening.

2. Make candy and wrap attractively for Christmas gifts.

II. "Breads and simple cakes which we can make at home."

Muffins, baking-powder biscuits, cup cakes, cookies, bread; visit bakery. (Bread or cake contest suggested as climax of this series.)

—Towels, holders, or other articles needed in the school.

"What kind of a waist can I make for myself?" (Outside clothing is naturally more interesting to children than underwear.)

Kimono waist, *Middy blouse*, or other simple design in fashion.

(This work would be interrupted by the lessons in house furnishing.)

"How can we make our home attractive to our family and our friends?"

Series of lessons on simple home ideals. Concrete problem, study of principal's office (or other room), with view to redecorating and freshening. Make new curtains, couch cover, or sofa cushions according to needs; choice of new rug, if possible, or freshening of old. Clean room thoroughly and divide class into committees to care for room daily for month.

Hygiene of Clothing.—"What sort of clothing do I want for outdoor good times this summer?"

Two lessons devoted to the examination and criticism of underwear, shoes, dresses, and outside clothing should be made very concrete by the use of actual garments, selected fashion illustrations, shopping excursions, etc.

III. "We need foods that contain protein."

(*a*) What are they?

(*b*) How must they be cooked to be most valuable?

Series of lessons on cookery and service of eggs and meats, emphasizing rule for cookery of protein alone and in combination with other foods; study of meat substitutes; cookery of peas and beans; place of salads.

IV. "What can we do to help in keeping babies well and happy?"

Lesson on bathing and dressing of baby; followed by visit to day-nursery.

(*Note.*—A washable doll equipped with real clothes is a possible substitute for a live baby,

and permits individual handling by the children; but demonstration of bathing the real baby is urged.)

V. "What can we serve for refreshments when we entertain our friends?"

Making of sherbet or lemonade; review cookies.

SUGGESTED COURSE FOR GRADE 8

Aims of Work in 8th Grade.—This course includes a study of the division of the income as it affects the home activities already listed; and in addition it aims

1. To encourage the girl to consider the problem of home-making as vitally worthy of intensive study.

2. To make the girl independent and dependable in solving the problems of the home, and conscious of her power as an intelligent consumer.

3. To broaden the vision of the girl as regards opportunity for future education.

Setting.—Mr. and Mrs. K. and their children—Mary, aged 14, Hans, aged 8, and Betty, aged 2—have moved to the city from Connecticut. Mr. K. is a salesman earning $1,200 per year.

Choice of Materials for Underwear.—"How can Mary make her underwear so that it will be pretty, comfortable, and economical?"

Chart.—Each girl make a chart of cotton materials and suitable trimmings. Samples should each be labelled with name and price. Choose materials.

Undergarment Suggestions.—Petticoat, chemise, underwaist, or drawers of simple pattern.

1. Emphasis on technic.

2. Understanding of commercial patterns, altering to measure, fitting.

3. Commercial versus home-

I. "What must Mr. K.'s salary pay for? How can he and Mrs. K. divide it so that they can pay the bills and still have some left for a rainy day?"

(*a*) Division of income.

II. "What can Mrs. K. do during the summer, while visiting her mother on a Connecticut farm, which will help to keep the grocery bills lower in winter?"

Make jellies, can fruit; make pickles.

III. "How can Mrs. K. plan her meals so that her family will have the food they need for health and growth?"

made underwear. Comparison of prices and beauty.

4. Ethics of buying, sweat-shop labor, work of Consumers' League.

(*a*) "White list" of stores selling garments made under acceptable conditions.

(*b*) "Do your Christmas shopping early."

CHRISTMAS WORK

1. *Garment-Darning.*—Helping seventh-grade girls in collecting and freshening the garments to be sent to the needy of the neighborhood. This class can do the garment-darning on woollen clothing,

Suggested sandwich combinations for Mr. K.'s and Mary's lunch boxes.

(Prepare and pack lunches.)

IV. Mrs. K.'s hygienic responsibilities; sanitation in the home.

(*a*) Study of plumbing; care.

(*b*) Saving plumber's bills.

(*c*) Care and cleaning of refrigerator.

(*d*) Insect pests—cause and extermination.

V. "How much shall the K. family spend for Thanksgiving dinner? What shall they have?"

THANKSGIVING LESSONS

(*a*) "What less expensive meat can take the place of fowl? Prepare rolled flank steak with dressing."

(*b*) "What pudding can Mrs. K. serve at little expense?" Prepare inexpensive steamed pudding.

(*c*) Plan for basket to be sent into neighborhood home where needed; children select and purchase food and pack basket.

VI. Using the "left-overs" as a means of keeping down grocery and meat bills.

Review of white sauce, make cream soups, escalloped dishes or creamed vegetables; hash; salads.

CHRISTMAS WORK

VII. Preparing for the Christmas holidays, grandfather and grandmother to be the guests.

(*a*) Cleaning the living-room and decorating it with Christmas greens.

also wash the woollen garments, sweaters, or children's dresses and coats that they may be sent out in good condition. The moth holes will naturally bring up the proper care of clothing against pests.

2. Christmas gift for relative or friend; small articles decorated with hemstitching or French embroidery.

"Mary must choose some new spring clothes. She has a ——, ——, —~—, and a ——, in certain definite colors. What shall she get for a coat? A hat? A party dress?" Two or three lessons may be wisely devoted to this discussion of samples and fashion illustrations. They will be much more helpful if paralleled by art lessons in which the girls might start with traced copies of a girl's figure and design dresses, coats, and hats suited to their own needs. Simple dressing of the hair to correspond with the lines of the face should also be considered.[1]

Making Party Dress.—Each girl select inexpensive material for a dimity, lawn, or flaxon dress. The design should be very simple. The dress may be used for exercises at the end of the year.

Emphasis must be given to

1. Technic of fundamental processes.
2. Altering of patterns, cutting, and fitting.
3. Dainty finishing.
4. Modesty in dress.

(*b*) Home-made candies and cookies as gifts for friends.

VIII. "Shall Mrs. K. bake or buy her bread?"

(*a*) Make bread—white and brown—and rolls.

(*b*) Bread contest and sale, emphasizing ethics of *perfect product* in selling.

IX. "The fire of hospitality in the home and the glow of cordiality in the heart." "Mr. and Mrs. K. entertain very simply. What shall they serve?"

(*a*) Suitable refreshments for winter.

1. Doughnuts and coffee.
2. Cocoa and cookies.

(*b*) Suitable refreshments for summer.

1. Lemonade or punch.
2. Sherbet or ice-cream.

(*Note.*—Teachers' or parents' meetings may be the occasion for these lessons, and the girls given the actual problem of acting as hostesses.)

X. "What shall Mrs. K. serve for breakfast in winter which will supply necessary food material for the various members of the family?"

(*a*) Cookery of cereals; use of left-over cereals.

(*b*) The main breakfast dish in winter.

1. Bacon; gravy.
2. Beef balls.
3. Creamed beef or codfish.
4. Warmed-over potatoes.

(*c*) Plan the breakfast; make market list.

[1] For description of such a course see *Household Arts Review*, February, 1913.

5. Suitability to occasions.
6. Testing materials for fading in sun and washing.

(*d*) Serve breakfast.

XI. "How do Mrs. K.'s simple tastes in dress and house furnishings affect her laundry problem?"

(*a*) Laundering white waist or apron, involving starching. "How much help can she afford?"

(*b*) Visit to laundry; sanitary conditions; prices.

XII. The planning of the dinner.

(*a*) Vegetable cookery.

(*b*) Meat cookery; roasting, sautéing, stewing.

(*c*) What must Mrs. K. consider in selecting her markets?

(Visit markets.)

XIII. "Mrs. K. finds that she cannot afford meat every day. What may she serve in its place which will give her family protein?"

(*a*) Prepare kidney-bean stew or dried-pea or bean soup.

(*b*) Visit canning factory.

XIV. "Mrs. K. finds that eggs are growing cheaper and taste better. How can she use them in planning her meals: For breakfast? For luncheon? For dinner?"

(*a*) Prepare poached eggs and omelet.

(*b*) Make custard—baked and soft.

(*c*) Make cooked salad dressing.

XII. (Concluded.) Planning and serving a dinner to the K. family for $1.50. "What shall they have? How shall the maid (who comes in occasionally to help Mrs. K.) serve it?"

This problem will serve as a climax for the year's work and emphasis should be laid upon

1. Well-planned meals.
2. Perfect products.
3. Color scheme.
4. Simple, attractive service.

XV. "Betty is in her 'second summer.' What can her mother and Mary do to keep her well and happy?"

(*a*) Preparation of food for babies and young children.

(*b*) Visits to milk stations; recreation piers, and day-nurseries, showing what is being done to save the babies.

XVI. Mary's birthday. What shall her mother serve at her party?

(*a*) Make ice-cream and cake.

Throughout this course emphasis must be laid upon civic conditions as they affect the home, and the responsibility of the woman as a consumer.

HOUSE-FURNISHING COURSE IN GRADE 8

Suggested Course in House-Furnishing in Grade 8.—A series of lessons establishing ideals in home-furnishing may be given either parallel to or blended with the course already outlined. It is desirable that a definite problem supply the motive for this work. A typical apartment or a group of rooms will give a tangible basis for the discussion and application of principles of art and sanitation. The needs, interests, and personality of each member of the K. family must enter into the problem of furnishing their home.

This course furnishes a fitting climax for the work in art, textiles, and sanitation. Furthermore, it should be supported by history and literature, in the growth of home and home ideals.[1]

[1] In the *Household Arts Review*, December, 1913, a description of such a course is given. Since the article was written, a more concrete problem has been the basis for the work.

SUMMARY

1. Since the Colonial period many of the home industries have been taken from the children's environment. As a result, the subjects of industrial and household arts have been introduced into the school curriculum.
2. These subjects have a twofold aim, namely, general education and technical skill as a basis for vocational efficiency, one of the five great aims laid down in the introductory chapters. The nature of the course of study varies to meet the general and the local needs of those it serves.
3. In the lower elementary school the work in industrial arts includes the subjects of household arts in that it deals with processes and products connected with foods and textiles.
4. Because of the class teacher's intimate knowledge of the children's needs and her ability to unify all the subject-matter to be taught, it is desirable that she teach the household-arts phases of industrial arts under the advice of the supervisor who can establish continuity throughout the school.
5. The ingenious teacher will find it possible to teach the household-arts phases of industrial arts in her own classroom by devising or procuring simple and inexpensive equipment.
6. In the upper elementary or junior secondary school the work in household arts is differentiated from the industrial arts, and is taught by a special teacher when possible.
7. The household-arts courses may well be organized on the basis of problems which children meet daily in their own lives.
8. The earlier methods of teaching household arts, *e. g.*, the use of small quantities in cooking, use of samplers and models in teaching stitches and processes of garment-making, the theoretical treatment of laundering, housekeeping, house-furnishing, etc., are all being superseded by the utilization of real-life situations.
9. The practice house, the canning clubs, the lunch-rooms, fairs, relief work of various kinds, home projects, and credit for home work, all offer opportunities for a kind of experience which is not only vitally interesting, but which is connected with the life experiences of the children.

PROJECTS IN APPLICATION

1. After studying the subject of spinning in the primitive, Colonial, and modern stages, plan a series of lessons for teaching the subject in Grade 4 in the school that you know best. What problems can you make out that will both help the arithmetic of the grade and the child's grasp of the spinning industry? How could you vitalize the geography, English, and spelling, through the same subject? How much physical activity is included in your scheme?
2. Adapt the subject matter of the spinning industry to Grade 2 in whatever school you may choose.
3. Plan a series of lessons for Grade 5 which will make the children intelligent in their appreciation of milk as a food and in the selection of the grade of milk suited to their needs, when the prices vary from $0.08 to $0.20 per quart. In what ways can the other subjects of the grade be made more live through connection with the study of the milk problem?
4. Plan a series of fifteen lessons in cookery to be taught to eighteen seventh-grade girls who, through heavy home responsibilities, see only drudgery in household work.
5. Adapt the same general subject matter to girls who seldom have the opportunity of working in their own home kitchens.
6. Outline six lessons in laundry work as related to textiles as you would teach it to a group of ten girls of twelve years of age in a city school in a congested district.
7. List fifteen articles that you would consider it sensible to have made by hand in a rural school district.
8. Select a detailed course of study in household arts for some elementary school. Criticise it both constructively and destructively in the light of your recent study.
9. Devise schemes for incorporating lessons on care of the baby, house-furnishing, keeping accounts, hospitality, care of the bedroom, care of clothing into a household-arts course in a conservative school.
10. What are the minimal essentials in home education in the first six or nine grades and what has been done to measure results in this field?
11. What does such education do for the five great aims of teaching—vital, vocational, avocational, civic, and moral efficiency?

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CHAPTER XII

INDUSTRIAL ARTS

Preliminary Problems

1. What capacities do children possess that require work in the manipulation of materials and tools for their appropriate development?
2. In industrial-arts work, in how far should children deal primarily with ideas and in how far with mere physical execution?
3. If the worth of a school subject is to be measured in terms of the richness and use of its body of thought, what changes are needed in the work usually called manual training to give it a place in school comparable with arithmetic, geography, and history?
4. Assume that in a given unit of industrial-arts work not one of the children is ever called upon in after-life actually to do the kind of hand-work used. What must be the character of the study of the unit as a whole to justify it educationally?
5. Make a list of the questions you yourself need to ask and answer in order to purchase clothing with intelligence and satisfaction —quality of goods, design of fabrics, construction of garments, prices, and other important questions. Write a similar list for furniture and for foods. What problems might a course in industrial arts consider in bringing out values not usually included in manual training?
6. What are the industries about which it is most important that we should know in order to be intelligent consumers?
7. How does the study of the industries for giving the information and training required for intelligent selection and use differ from the technical training required for the industrial producer?
8. If you are a teacher without special training in industrial arts, how may you go about it to develop for yourself one kind of work at a time until you have adapted a full programme to the needs of your particular grade or grades?
9. If you cannot introduce industrial arts as a separate subject in your programme, which of the problems discussed in the following pages can you introduce as parts of or in connection with the regular subjects of your school—arithmetic, geography, history, hygiene, nature study, or English?

I. Industrial Arts in the Modern School

Need for Industrial Arts in Schools.—Our foods, shelter, clothing, tools, machines, and many other needs are all made from natural materials. To be of final use to us most of these materials must be changed from their natural state. Wood must be made into furniture, implements, or buildings; cotton and wool must be spun, woven, and made into garments; metals must be refined and formed into tools, machine parts, building constructions, and many other forms. These changes from materials as provided by nature into products for use are called manufacturing processes or industrial arts.

A study of the industries or industrial arts in the elementary school is of greater importance than ever before, because of the concentration of industries in factories and shops, away from the home and every-day life of our time. The information and attitudes desirable about the making of our clothing, furniture, shelter, foods, and other products were once gotten by children in their own homes and through their own participation. But to-day, if this experience is to be had at all, it must be gotten through the school.

Values: Information.—The proper study of industrial arts should give values of three kinds, namely, information, appreciations, and habits and attitudes. The information most immediately valuable is that which makes one intelligent about industrial products from the standpoint of the consumer. We all have to select and purchase clothing, but few have to make it. The information all need about clothing is that of economic values, health qualities, appropriateness of various kinds of clothing to various purposes and occasions, and the proper care of clothing. To get this information we must learn something of the various processes in the making of fabrics—spinning, weaving, dyeing, designing, and finishing. We must know the various methods of adulterations, so that we can detect shoddy and other inferior goods. We must know the several tests by which to identify each

particular textile material—cotton, wool, linen, and silk. All of these facts help us to judge of values in buying clothing or clothing materials. For furniture, the problem is also one of buying rather than making for most people. To buy intelligently, we must know the kinds of wood used in furniture, together with their desirability and proper cost. We must know as well the various types of construction—which are substantial and durable and which are not. Many of the problems about foods are also those of food values and cost values—matters of information that help us to purchase and use foods wisely and economically.

Appreciations.—The second value for the study, that of appreciations, has to do with the cultivation of taste. We desire to train children to know good standards of form in all products and to like these. We want them to know good design in all its elements so that they will be able to select furniture, clothing, china, rugs, wall-papers, and all other material products, so that these will be beautiful and in harmony with their purposes. School work should lead the children to know when things are beautiful by all good standards, to like that which is beautiful, and be influenced in their choices by this work.

Habits and Attitudes.—The third value, that of habits and attitudes, comes as a kind of by-product of the proper emphasis of the other values. The attitude of carefully considering everything made or purchased from the standpoint of its economic value and its qualities of design or beauty naturally results from a consideration of these points in every problem taken up in the school. To avoid the waste of money, to get thoroughly good qualities, to secure designs that are excellent and permanent, is an attitude of very great worth to both men and women. The habits of thoroughness, of carefulness in workmanship, and of thinking a problem through before beginning its execution, are all inherent in the study of industrial arts.

A further and more largely social kind of information, of

attitudes, and of appreciations is also included in a study of *present-day industries*. We should all know something of the factory system of to-day, the large amount of automatic machine production, the kinds of work each worker does, the surroundings of workers as to health, moral conditions, wages, and the relationships of the worker and the employer, the risks of limb and life, and such other questions as enable us to act intelligently as citizens. When we find sweat-shop conditions in an industry, we should be able to do something to help its workers. This we may do by buying from those producers only who have good conditions and pay living wages, and by helping to pass and enforce laws abolishing improper conditions. Our study of the industry should provide us the information, and cultivate in us the appreciations and attitudes of mind toward the workers in industry which will help us to be just to them and aid, as good citizens, in making their conditions of work and life wholesome and happy.

Industrial Arts vs. Manual Training.—This kind of study of the industries emphasizes their present-day methods. It differs from manual training in this particular. Manual training has emphasized very largely the development of manual dexterity and such physical and mental growth as might be promoted by this. Industrial arts includes all that might be thus accomplished by manual training and adds a great deal more. Manual training has been content to make a tabouret or a towel-roller or some other simple piece of furniture by handicraft methods; to make several garments by emphasizing chiefly the cutting and sewing processes; to make a few bowls or vases of clay by hand methods; and to omit almost wholly, whatever the field considered, the present-day problems of machine production, factory organization, and social changes which are so prominent in the world of industry.

A Common Course the First Six Years.—Two rather different forms of industrial-arts study are appropriate in the

elementary school of eight years. For the first five or six years the work may be the same for both boys and girls, and without any reference to specific life-work later to be followed. The emphasis is from the standpoint of the consumer. The purpose is to provide that information, those appreciations, and those attitudes or habits which will be of equal value to all, whatever may be their means of livelihood. For the seventh and eighth grades the work may well be differentiated, the girls selecting the several household-arts fields included by foods, clothing, and the interior and decorative aspects of shelter, the boys selecting the wood-working, metal-working and allied fields usually occupied by men. The work primarily for girls is considered in Chapter XI, devoted to household arts. This unification of work for the first six years in many school systems is leading to the development of a six-year secondary school plan, with three years each for a junior and senior high school. The work of these seventh and eighth years, and of the ninth, also, in the junior high school, is of the kind to give boys a chance to try themselves out and to discover their own capacities. It has high values for vocational-guidance purposes.

To secure value from the study of industrial arts, it is clear that there must be a large body of subject matter or thought material for each industry, as well as many hand projects. While there is desired even more hand-work than is usually provided in manual-training courses, its purpose is more largely as a means than as an end in itself. Projects are made to clarify ideas, to serve as means of opening up the present-day field of some important industry, to cultivate appreciations in design and construction, to awaken right attitudes toward the workers in the industry, and to discover aptitudes and abilities for various types of industrial work.

II. Content of the General Course

The Unified Work of the First Six Grades.—That the study may accomplish the purposes required of it, the fields of industry must be carefully selected so that they will represent the experience of most use and value in daily living. On this basis, six rather large and definite kinds of industrial needs may be chosen as of fundamental importance. These are our needs for food, clothing, shelter, records, utensils, and tools and machines. About each of these large needs may be grouped problems and projects suited to clearer understanding and appreciation of the industry. The grading of these problems and projects is not a very difficult matter. Much flexibility may be used. Various problems may be placed in any of the first three or four grades, many others in any of the grades between fourth and sixth, inclusive. In suggesting problems and projects under each of the six fields, the order followed is that which has been found very satisfactory in practice through the first six grades.

Foods.—Simple problems in what we eat, how our needs are supplied, and how some kinds of food are preserved for winter use may be taken up in the first grade. The canning or preserving of some one fruit may be done as a school project. If there is a school garden, use some product from it. A simple study of the grocery and fruit stand as the immediate source of foods may be made. A small display stand of wood for showing fruits and vegetables may be made and used. Some clay-modelling, paper-cutting, and painting lessons may use fruits and vegetables as studies, calling attention definitely to form and color. The cleanliness of foods eaten, the avoidance of decayed fruits, and the need for cleaning foods thoroughly are suggestive topics in the hygiene of foods.

The early methods of food preservation as drying, salting, and smoking; the preparation of food for the table; noting

A first-class manual-training room. Office and lumber-room back of demonstration platform. Cincinnati public schools

A variety of hand-work appealing to boys and socially worth while. Boy on left mending his shoe

the kinds of food that are cooked; the kinds of food as to plant and animal; the sources from which the grocer and fruit dealer secure their supplies; storage of fruits and vegetables for the winter; milk and milk products, showing the value of milk as compared with other foods, the making of butter and cheese; ways of thickening milk with flour, egg, starch, and rennet; a study of some of the tropical or subtropical fruits, as oranges, dates, figs, and olives, with the uses of these; the drying of apples and pumpkins; the methods, historic and present, of making meal and flour; visiting a mill, if possible; and other simple problems and projects may be suitably adapted to second and third grade needs.

Studies of eggs—food values, preserving, testing, uses in preparing other foods, and cooking; starch—food values, tests, methods of cooking and using rice and macaroni; manufacture of macaroni; fish—food value, methods of preserving, kinds, sources; serving a luncheon, showing a well-balanced meal by proper selection of foods; and simple projects in cooking, as boiling eggs, cooking rice with cheese, cocoa; baked potato, and oyster soup or chowder may be used in the fourth grade.

For the fifth and sixth grades problems in the study of cereals, meats, sugar, market-gardening, the by-products of foods, fermentation, beverages, dietaries, the economics of foods and simple projects in the preparation and cooking of some of the foods studied may be taken up. For schools having no equipment for cooking, much of value can be accomplished by the study of foods, and the projects other than those of cooking may be carried out. Teachers may well secure the co-operation of mothers and provide for some simple but valuable experiments for the children in their own homes. The school should be willing to give credit for all such home work when done as directed and when results are shown.

Among the most important of the values of food studies here suggested are those of economic selection and buying

and of the hygienic problems of food. The purpose is not to make cooks any more than the study of poetry in the elementary school is to make poets. The work which provides training for cookery courses in later grades is discussed in the chapter on "Household Arts."

Especial attention should be directed to the problem of pure foods, of how to detect impurities, and of how to aid in pure-food production and selection. Problems in the purchase of foods should be emphasized. Methods of buying—by telephone, by the order clerk who comes to the door, and by visiting the grocery or meat shop, should be compared as to results in the selection and cost. How to get the right food values at the smallest reasonable cost is an important problem. How to use every part of the food purchased, the avoidance of waste, is part of this problem. Emphasis throughout the work should be upon those factors that make for wholesome, economic, and happy usage of foods.

Closely related to the food studies are problems of importance in table service, table conduct, and in accessories of dining-room and kitchen. The place of the daughter in the problems of cooking, sewing, and related work, and of the duties, privileges, and relationships of the cook or maid in homes having one, may be appropriately considered.

Clothing.—The study of clothing includes knowledge and appreciations which enable us to select clothing and clothing materials as to quality, durability, cost, and good taste. The making of simple looms and the weaving of a rug, a washcloth, and a bag, belt, or tie may be used as means of studying the various methods, ancient and modern, of spinning and weaving. In middle and upper grades, such study should include a knowledge of sources and characteristics of the four principal textile fibres—cotton, wool, linen, and silk. One of the very important items of knowledge we should all have is that of the methods of testing cloth, to know of what it is made and to know of the various forms of adulterating textiles and how to avoid these. Testing textiles by appear-

ance, touch, burning, and simple chemical tests should be a part of the work. This is quite as important for boys as for girls, as all have the problem of buying clothing sooner or later. Connected with these studies of textile manufacture there should be a consideration of the great present-day power-plants for spinning, weaving, and knitting, their locations and the causes for these, the amount and evils of child labor in mills, and the historic development of textile manufacture from the simple hand methods of primitive peoples, the household methods of Colonial and former days, and the industrial revolution, with its inventions by Cartwright, Kay, Hargreaves, Arkwright, Jacquard, Eli Whitney, and others, and the effects of their inventions upon the industries and the social life of the people.

By such projects as dressing dolls, making bags for gymnasium shoes, laundry, or other needs, making work aprons, dressing dolls in middle grades in the costumes of various nationalities, darning stockings and sweaters, patching garments, drafting a pattern for some simple garment, buying the goods and making the garment, adapting a commercial pattern to measurements, sewing on the machine, and other problems connected with every-day life needs, the children will learn the various types of stitches, develop familiarity with plain hand-sewing, become acquainted with the sewing-machine, if this is available, and learn much of importance about garment-making and purchase of clothing. Throughout the work there should be constant attention to the selection of goods and garments appropriate to definite purposes. Textiles and garments appropriate from the standpoint of health, seasons, occasions, and economy in cost and durability is a very real problem. In all of the work the art element should be sufficiently emphasized to cultivate good taste in dress. The field offers one of the best of opportunities for studying good design. Textile design, problems of line, tone, and color harmony in dress, and the relationships of style to good taste may all be emphasized to great advan-

tage. If children can be taught that, no matter how small the amount to be expended for clothing, combinations of line, tone, and color may be secured that are pleasing and beautiful, it will mean that all the time and effort expended in such studies are well worth while.

Clothing budgets for individual children and for families should be studied. How much does it cost to clothe a child for one year? How much for a grown person? What should a good pair of shoes cost? May one really profit by purchasing clothing at special sales? Are clothes of good quality really more expensive than those of poor quality? These are questions suggestive of those that may be taken up with much practical profit.

Shelter and Furnishings.—The study of shelter and house-furnishings includes that knowledge and appreciation of materials, construction, and decoration which should enable us to live comfortably, economically, and in pleasing surroundings. While relatively little may be done in constructing buildings or furniture typical of commercial methods in the first six grades, much may be done in gaining ideas and ideals which make for the selection of the right kinds of homes and furnishings.

In the first grade, the construction of a house, using boxes for individual rooms, assembling them as a house of one story, two stories, or an apartment-house, offers opportunity for several months of study of excellent value. A key-hole saw may be used to saw out doors and windows; window and door frames, base-board, and roof may be made and placed. Brick-moulds may be made of wood, and bricks moulded from clay for a chimney. The work of the carpenter and the mason are thus introduced. Paper for walls may be designed, made, and hung. Linoleums for kitchen floors may be similarly made. The exterior of the house and its casings and base-boards may be painted. The work of the paper-hanger and painter will thus come into the study and will enlarge the appreciation of our dependence upon the workers

Hand-work at the elementary school of the University of Chicago

A handicraft exhibit of Cincinnati public schools

in the various occupations. The house may now be furnished with small beds, tables, chairs, bureaus, sideboards, bookcases, and other furniture; with suitable kitchen and bathroom equipment, part of which may be moulded in clay; and with curtains, rugs, bed-clothing, and other textile materials made by the children. As a vital part of the method, many visits should be made. These should include a house in process of construction, a house in which paper-hangers and painters are at work, a furniture store, a wall-paper store, a dry-goods store, and any other places which would give ideas of how these various material needs are actually supplied and the problems that arise in their selection. It will be noted by the children that bricks, stone, cement, and iron are also used as building materials.

In the second grade, furniture of a more substantial form than that used in furnishing the house may be made. A plain form of furniture, very attractive, has been made in the second grade by using screw construction. Chairs as large as kindergarten chairs, tables at which these may be placed, beds thirty inches long, and bookcases and buffets in proportion, have been made with decided success. Each piece is made by a group of from two to five children. When made, the furniture is used for study of the use and care of the several rooms to which they respectively belong—dining-room, living-room, and bedroom. This furniture may be made in the grade room and requires no shop and but few tools—rulers, try-squares, saws, a plane, hammers, and screw-drivers. For glass effects in bookcases and sideboard, celluloid or isinglass sheets may be used. In studying elementary aspects of the sources of lumber, a lumber camp may be made on a sand-table. Excursions to a furniture-repair shop and to furniture stores should be a part of the work. All work in this field should relate to the use, appropriateness, selection, and care of furnishings in the home.

In the third grade the homes of other peoples, present and historic, provides much opportunity for closely related work

in geography, history, and industrial arts. Indian wigwams, cliff-houses, Eskimo houses of snow, Hebrew tents, as differing from wigwams, showing adaptations to conditions of pastoral life, and sun-dried bricks as used for the houses in the later period of Hebrew life are all possible subjects of study and problems for projects in house building and furnishing. The making of a loom with a simple heddle is a project for further work in wood. *In the fourth and fifth grades*, shelter and furnishing problems of Greeks, Romans, and later European peoples may be studied, showing the growth made by man in his use of more difficult materials, and his great advance in architecture as found in temples, cathedrals, and castles. *In the fifth grade*, study of lumbering, milling, and manufacture of woods into building materials, vehicles, and furniture may continue in connection with regional geography. Projects in wood may include window-boxes or other boxes with butt-joints, game-boards, picture-frames, and a potter's wheel, or a loom as needed in other lines of work.

In the sixth grade the Colonial house of logs and the later developments of shelter down to the present may help to develop a usable knowledge of the problems one has to solve in selecting and caring for an appropriate home. The present variety of materials, their cost, durability, and appropriateness under differing conditions of climate and city or rural environment, are studies worth while. Problems in lighting and heating are appropriately included. The sanitation and hygiene of the home and home life may be vitally related at many points in this study of shelter. Projects in wood may include a book-rack, wooden forms for concrete projects, and projects in wood as needed in other fields.

Throughout this work, the emphasis is upon that intelligence and appreciation needed for the selection and care of the home through a knowledge of its materials, its purposes, and its evolution. By the projects in various materials for sand-table and in shop, habits of dexterity and constructive control are normally developed.

Records.—The problem of the race in recording its experiences has resulted in the present great arts of printing and publishing. The evolution of this industry from the simple cairn, or pile of stones, through notched sticks, picture-writing, invention of the alphabet, tablet and stylus, wood blocks, movable type, printing-presses, and the marvellous type-setting machines and printing-presses of to-day makes a story of interest and value.

In lower grades, booklets of very simple form may be made for written work, drawings, and small charts. Sheets cut to appropriate size may be folded in the middle to form a hinge and tied with cord. Others, as for spelling lists, may be cut in appropriate strips and tied through holes punched at one end. In the third grade, binders in simple form with a hinge are easily made. In the fourth grade, pamphlet-binding may make up one or more projects, and a one-section book with a cloth-case cover and single-end sheets may be made. The historic aspects of book-making may be taken up in connection with history, or, if there is no such work provided in the course of study, the stories of parchment, of the invention of paper, of hand-copied books, of the invention of printing, and others may be introduced from time to time in connection with book-making projects. In the fifth and sixth grades, binders with hinged joints and eyelets, and a final book, sewed on tapes with double-end sheets, may be made. For the end sheets of the book, wood-block designs may be made for their decoration. An illuminated initial letter will introduce a study of the interesting illuminated lettering of books and manuscripts of the Middle Ages. Children may well begin to make card catalogues of references used in various subjects. A catalogue case of cardboard, with gummed-tape joining, is a good project for the fifth grade, while a similar case of wood may be made in the sixth grade.

Visits should be made to a printing establishment, if possible, where linotype or monotype machines, cylinder presses,

etchings, electroplating, color illustrations, machine binding, and other methods of this large industry may be studied. Attention to design in books and periodicals, quality of materials and binding, and care of books are all important elements. The present sources of wood-pulp and other materials used in paper-making connects the work with some phases of geography and current civic problems.

Utensils.—Utensils are made of clay, wood, metal, paper, and some other materials. The making of simple utensils in clay by the several methods of hand-modelling may be begun in the first grade and continued through the six grades with one or two projects each year. Commercial methods of making china and other pottery lead to a study of the potter's wheel, one and two piece moulds, glazes, decorations of various forms, and the characteristics of Italian, French, Delft, Dresden, English, and American wares. The pottery of historic peoples is worthy of attention, notably that of the Greeks. The stories of Palissy, Wood, and Wedgwood may well be connected with the study of pottery. Especial attention should be given to design in present-day wares found in stores and shops.

In the sixth grade, some simple forms of flower pots or boxes may be made of concrete, the forms providing good projects in wood-working.

Boxes of cardboard or paper may be made, as use for these appears in the several grades. A box for seeds, for candy, for gloves or handkerchiefs, a catalogue-card case, or a pencil-box are illustrations of possibilities in cardboard.

In the fifth and sixth grades simple copper bowls may be made by hammering and annealing. The process of etching may be shown by etching a simple decorated design on such a bowl.

Box forms in wood have been referred to under shelter and furnishing. One basket in each of two or three grades may be made illustrative of processes of weaving as modified for coarse materials and varieties of forms.

Filipino industrial teachers studying construction of baskets in commercial demand. Bureau of Education, Manila, P. I.

In all this study of utensils the projects chosen should be the means of approaching the industry in its present aspects, and of leading to an appreciation of the factors concerning it which it is useful for us to know.

Tools and Machines.—While relatively little may be done in making tools and machines in the elementary school, a great deal may be learned of their use and importance. Industry grows yearly more and more away from hand processes to machine processes. But every machine had its forerunner in a hand-tool. The uses of hand-tools in wood-working, preparing foods, textile manufacture and sewing, metal-working, pottery, and in agriculture, are learned as they are employed in these several fields. The making of looms, potter's wheels, water-wheels, windmills, rowboats, aeroplanes, derricks, and other mechanical devices gives practice in the study and application of numerous simple mechanical principles. These principles and their wider application in machinery should be emphasized wherever possible. The constant contact with many machines, simple and complex, may be used as an approach to a more detailed study of some of these. Bicycles, automobiles, and other vehicles, lifting pumps, vacuum cleaners, sewing-machines, power-driven saws, planes, hammers, and other machine-shop equipment, hand and power driven printing-presses, electrically driven machinery of all kinds, the great variety of farm implements for seeding, cultivating, harvesting and threshing, churns, washing-machines, and all other household devices—all of these are opportunities for study in this field, some knowledge of which is so essential to an understanding and appreciation of present-day industry. One of the purposes of excursions to industrial plants is to give this appreciation of the meaning of machinery in the industries as they are to-day.

Survey of the First Six Grades.—From the foregoing brief outline of possibilities for a course of study in the industrial arts in the first six grades, the very close relationship between this work, arithmetic, geography, and history will

be apparent. Much of the work in these three fields can be quite directly motivated by problems and situations in the industrial arts. By due emphasis upon the common facts and problems included in the industrial-arts course, the work of the teacher is made easier and more effective rather than increased. Meanings are more clearly seen by the children, and the relationships vitally connecting one subject with another make each support and help the others.

III. Differentiated Work for Upper Grades

Seventh and Eighth Grades.—With the background of general industrial intelligence and the manipulative dexterity acquired in the first six grades, more intensive and detailed study of the most prominent mechanical industries may be made. For this work shops will be required. The work should employ as largely as possible the methods used in industry as actually carried on in the present day. Cabinet-making and elementary carpentry in wood, foundry work, forging, and machine-shop work in metals, plumbing, electrical wiring and construction, and printing are possible fields. Cabinetmaking in wood, foundry or machine shop work in metals, and printing might well be selected in smaller schools able to provide a small equipment. If one line of work only can be employed, probably wood-work is the most valuable because of the range of tools and machinery used. A shop for this work should have a circular saw and a lathe, as well as the usual hand-tools. The early use of machines is desirable in setting up ideals and giving standards of efficiency. Hand-work is improved rather than impaired by machine-work.

For projects in wood or metal, it is impossible here more than to suggest that they should be typical of those demanded by the conditions of life round about. Care should be taken that they be graded in such a way as to develop increased capacity in the range of tools and processes included. Visits

to commercial shops should always be an important part of this work.

In printing, there are always projects for the school board which make it practicable to do work on a commercial basis from the beginning. Programs, report cards, notices, and other forms are in constant need in a school system.

As an integral part of the industrial-arts work there should be problems in constructive drawing and design and in industrial arithmetic and geometry. The industrial drawing and design should develop in direct relationship with the shop problems, and the mathematical problems should be those needed by the industrial worker in measurements and estimates, and in time and wages.

Many problems in geography, history, and civics should also be approached through the study of industrial materials, manufacturing centres and markets, and to social phases of industry. Safety devices, shop sanitation, employer's-liability and workmen's-compensation laws, factory inspection, labor laws, trade-unions, and the legal and moral privileges and obligations of workers and employers should all have a place in connection with the industries studied. Wages, standards of living, opportunities for advancement, and the probable future of the industry should be considered. Aptitudes required for success, and especial attention to each boy's capacities as shown by his work, should be thought of in connection with choice of vocation.

For helps in the selection of projects teachers will find many text-books in any of the fields indicated. These should be consulted and used for whatever they may contribute, but care must be taken not to follow mechanically, or the vitality will be lost from the work. Contact with living industry itself and suggestion and guidance from it are the means of making the work of most value, both educationally and vocationally.

SUMMARY

1. Industrial arts is a study of the changes made in natural raw materials, converting them into products of greater value and use. This study includes consideration of materials, processes, methods of construction in relationship to use, economic values, and elements of industrial design.
2. Industrial arts in the elementary school considers the problems of selection of materials and methods of construction more from the standpoint of the user than from that of the producer. It is not a study of industry for vocational production. It attempts to provide that information, develop those habits and attitudes, and cultivate those appreciations which will make intelligent consumers and citizens.
3. Problems in construction are not primarily to develop skill in production. While reasonable growth in manipulative skill is an important by-product of the work, the higher aim is to develop insight and appreciation, which cannot be secured without active participation in the use of materials.
4. Since our most common need for art appreciation is in the selection of products that should be beautiful rather than ugly, every project in industrial art should be a problem in fine art. The development of standards and principles of good design and of a love for good design may be most effectively secured through a study of these standards and principles as they are applied in clothing, house-furnishings, and other material utilities.
5. For the first six grades the work may well be the same for both boys and girls, and without reference to future vocations. An organization of the six units, foods, clothing, shelter, utensils, tools and machines, and records, provides the fields of industry of most importance to all people. Suitable problems in each of these fields may be selected for each grade, the problems growing more complex and difficult as children advance in age and grade.
6. In the seventh and eighth grades the work should be differentiated for boys and girls, the girls taking up the more direct and technical phases of household arts. Boys should continue to work more intensively in the industries using wood, metals, concrete, and some other materials. Industrial conditions, as well as industrial processes, should be studied more thoroughly. The purpose is to develop broader industrial insight and intelligence, and to provide vocational-guidance values through testing capacities and interests.

"Little Mothers" at their basketry in a summer school and playground, Hartford, Conn. Hand-work, play, stories, and the three R's

7. The equipment for industrial arts in the first six grades need not be very elaborate or very expensive. Many commonplace materials may be used. The industrial needs and activities of the community should be studied extensively through visits and through descriptive printed matter and pictures.
8. In the elementary school, the very vital relationship between industry and the other school subjects indicates that it is highly desirable that the regular grade teacher should teach the industrial arts as well as the other subjects. So treated the subjects help each other and the work becomes unified and forceful.

PROJECTS IN APPLICATION

1. Make a full outline of the important facts one should know about the use, preparation, and care of milk and milk products, arranging these so that each grade will have those problems best adapted to its abilities. Make a similar outline for cereals, for meat, fish, and eggs, for fruits, and for vegetables.
2. Make a list of the most important facts one should know about the four principal textile materials—wool, cotton, linen, and silk—and suggest simple projects in the selection of materials, cutting, and sewing which will lead to a study of these facts.
3. Make a collection of samples of each of the principal textile materials which will illustrate the various forms of textile design, and the differences in goods of different qualities and prices.
4. Compile a list of the several simple methods for testing the purity and quality of each of the important textile materials, and teach children how to make these tests.
5. Outline the most important points one should have in mind in the selection of furniture to secure excellence in material and construction, good design, and reasonable cost. Plan several simple projects in wood which will form a basis for the study of these questions.
6. Plan the building and complete furnishing of a doll house, connecting with the various projects in construction a study of the work of those producing and handling these utilities commercially—the carpenter, mason, paper-hanger, furniture store, dry-goods store, and others.
7. Plan a series of simple booklets which may be made by children, which will illustrate the essential steps in the making and binding of books. Organize the more important steps in the evolution of printing and book-making, and the present conditions in the printing and publishing industries.

8. Make a list of the facts which are of the greatest importance in the proper selection, use, and care of utensils of various materials, and plan projects in pottery, box-making, and basketry which will provide a knowledge of these facts.
9. Make an outline of the labor-saving devices, the implements, and the vehicles and other forms of machines in common use in the household or out of doors. What are the principles and facts about machine construction and operation which every one should know to be efficient and intelligent in the general use of machine implements and tools?
10. After planning an adequate course in industrial projects and studies, make a list of the questions raised in these problems and studies which connect the work vitally with arithmetic, geography, history, civics, hygiene, and fine art. Note that these studies provide a means for unifying a very large part of the curriculum, offering problems of real meaning and of high value in every-day life.

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CHAPTER XIII

FINE ART

Preliminary Problems

1. What evidence have you observed which indicates that children have instinctive interests in artistic expression?
2. In what ways do children manifest such interests?
3. What was the attitude of the old-time school teachers toward such expression in school?
4. Are the houses, barns, fences, and shrubbery outside, and the wall-paper, furniture, clothing, carpets, and pictures inside, of the homes of the persons who went to the old-time schools in good taste, or do they show a lack of esthetic education?
5. What beauties of nature and of man's artifices are most unappreciated by the people of your community?
6. What ways can you suggest for promoting the appreciation of beauty?
7. Does one have to create beautiful things in order to gain appreciation?
8. What means can be employed for getting ugly school buildings made artistic?
9. What is the best way to make an ugly schoolroom wall artistic?
10. Can art appreciation be developed by an artistic environment alone?

I. Its Place in Community and School

Art Appreciation the Chief Aim.—That the development of art appreciation is of far greater importance in general education than the teaching of delineation, will hardly be questioned by any mature man or woman who has experienced the pleasures which art offers. To such an individual art in its various manifestations is recognized as one of the major interests of all highly civilized peoples. Indeed, it is very largely through their remaining examples of art that we have gained our knowledge of past civilizations. So, in

theory at least, nearly every educated man assigns to the development of power to appreciate art an important place in general education.

Practice in Drawing a Means of Acquiring the Ability to Appreciate Art.—It is doubtless true that some have learned to respond keenly to the appeal of beauty of form, to the play of light and dark, and to subtle color relations, without having practised art. Nevertheless, it is obvious that art appreciation depends upon visual discrimination, and upon a realization of the principles of esthetic order which are difficult, if not impossible, to teach without teaching the actual practice of drawing. It should be evident, therefore, that the most direct means of developing art appreciation is through right instruction in drawing, which necessarily includes the constant study and emulation of fine examples of art. When a child attempts to represent an object, his mind is at once stimulated and directed to observe and to study successful representations of similar objects. The effort to arrange forms in order, which is design, arouses interest in looking at masterly designs, and makes it possible for the teacher to call attention to their excellencies with an assurance of being understood. Thus the heading of this chapter is significant of the fact that art appreciation and art practice should be considered as one subject.

Art Education a Gradual Growth and Change in Point of View.—The chief aim, then, in the teaching of drawing in the grades is the laying of a firm foundation for the appreciation of the beauties of form and color. This appreciation is only possible where the eyes learn to see distinctions in line, degrees of dark and light, and differences in colors that are not seen by the untrained. Art education considered in this sense is not the acquisition of a definite number of facts, but is rather gradual growth in the power to respond to visual beauty, the beauty of fine relationships of form and color. This gradual growth will result from wisely guided practice, stimulated and corrected by constant study of fine examples.

Study of Examples.—It may be asked whether fine examples of art are generally available for study? Happily, to-day the answer can be given affirmatively. New art museums have sprung up, and the older ones have grown rapidly; so that in many cities throughout the country co-operation between schools and museums is becoming an important part of the museum work. Where visits can be made to museums, the study of *original works* of art can be effected. Thorough preparation for a definite piece of study, well directed observation while at the museum, with some required note-taking or sketching, will give great value to the museum visit, even if it occurs only at long intervals.

In the form of photographs and the reproductions of photographs, we have to-day the world's art within easy reach. It is true that a photograph of a work of art, whether architecture, sculpture, painting, or one of the minor arts, means much more to those who have seen the original. Nevertheless, the excellent and inexpensive reproductions now available offer a wonderful source of supply of examples to the art teacher, a source which a few years ago was almost entirely lacking.

The best drawing-books now published offer an abundance of wonderfully good reproductions of excellent examples of all types of art work, carefully selected with reference to the age and interest of the pupils of each grade. Such books may well serve as portfolios of reference material for each pupil.

Art Education a Preparation for Good Citizenship.—The ultimate aim of art teaching in the grades is the education of citizens who shall grow up to demand the right kind of surroundings in the streets of the cities and towns and in the homes of the people, city or country. The art instruction which the schools have given during the past few years is already beginning to show results in a great popular interest in matters of taste, although doubtless other influences besides the school influence have helped to bring this condition

Art study and appreciation in a St. Louis public school

about. Certain it is that better-designed objects for every-day use are more in evidence in the stores to-day than they were a very few years ago. Many of the popular magazines are constantly publishing illustrated articles on the choice of home furnishings, on the arrangement of the different rooms, and all sorts of practical hints for creating more tasteful surroundings. Wide-spread interest in the beautifying of towns and cities has achieved much, and it cannot fail in the next few years to transform many places which are now unsightly.

The revival of pageantry and the great interest it is enlisting throughout the country is one of the most significant and popular expressions of the art instinct. The realization by the people of the traditions, history, industries, and callings of a community through artistic dramatization, and the idealization of the aims and aspirations of a city presented in symbolic form are art in the broadest and deepest sense. Form and color and expressively beautiful arrangements here may have full play. The influence of the artistry of the festival, whether in the great civic celebration or in a May Day celebration in a country village, may serve as a most complete opportunity for developing the art instinct.

The Art Teaching Should Extend to the Other School Subjects; Influence of Surroundings.—And the school which is to give true art training cannot confine such to the periods of the drawing lesson. The lessons in art appreciation, or at least in good taste, should be given constantly. The school building and grounds, and each schoolroom with its furnishings and equipment, if well designed, will help the pupils to gain right standards of taste. Pictures, casts, vases of flowers, and other decorations should only after careful consideration be in the places they occupy. Schoolroom walls should be restful in effect. The eye should not be forced to look at the pictures; for these should be of such subjects, color, and framing that they take their places on the walls with reserve. But they should be worthy of most careful study.

Dress of Teacher.—That the teacher who dresses in good taste exerts a strong and constant influence no one will doubt. A fine sense of fitness for her work, and for the position she occupies, as well as for her own physical requirements and her financial resources will cause her to think twice before jauntily adopting passing fashions for schoolroom wear. That Fashion is one thing and Style, in the true sense of the word, is quite another, is too often forgotten. Appropriateness, neatness, well-combined material and color may result in style in its best sense. At all events, poor taste and tawdriness will surely be in evidence unless these fundamentals are well considered.

Written Work, Festivals, Manual Arts.—Every writing lesson and, indeed, the written work throughout the school subjects, offers opportunity for the exercise of the principles of design. No craft is richer in examples of superb art than the craft of the scribe as practised before the days of printing. This craft of formal writing has recently been revived, and the study of writing as an art gives it a dignity and interest entirely lacking in the mechanical and prosaic penmanship still too often held as the final ideal in school writing. The need for invitations and programs for special occasions offers an ideal opportunity for design, as do also many other problems that naturally arise in connection with school festivals, such, for example, as designs for costumes, the making of significant decorations for the room, the painting of simple scenery, etc.[1] The teaching of the industrial and household arts cannot escape the constant need of the exercise of esthetic judgment which is in reality the study of design in a most practical form. Many of these art problems should be settled in the classes where they arise, for they cannot be taken over to the art class without loss of time and interest.

Enough has been said to indicate that the ideal in art

[1] See "Festivals and Plays," chapters XVI–XVIII, "Art in School Festivals."

instruction is to make the more formal instruction of the art periods serve as a means of developing an artistic consciousness which under right conditions will carry over with the aid of the teachers into all the school and outside activities. A person who is artistically educated according to the modern ideal is one who is widely responsive and generally creative in matters of every-day beauty. While the study of pictures is one important phase of art study, we should do away with the outgrown idea that art deals principally with drawing and painting. If such were the case, it could not hold the important place in education that it now does.

Drawing Regarded as a Fundamental in Education.—That drawing has some value as a soft-pedal disciplinary subject is not here questioned. Neither does it seem necessary to put in any plea for its utilitarian value. The larger aim of all art study which has here been set forth should include all other values. The ideal set is indeed high. It demands knowledge on the part of the teacher and feeling for the subject. But so does good instruction in other subjects, and fortunately good normal instruction in art and drawing is, possibly, as available as in the other subjects. In days past an excuse for poor teaching in the drawing was often given which was supposed to be valid. The substance of this excuse was that this teacher or that had no "talent" for drawing. This may have been perfectly true, in which case the drawing should have been taught by another teacher; but, on the other hand, teachers without talent in the various other subjects are not altogether unknown. Drawing and art are no longer regarded by educators as outside the learnable and teachable branches. They are now numbered among the fundamentals of a liberal education.

II. A Survey of the Work of the Grades

Representation and Design.—The course of study may be considered under the two heads Representation (pictorial drawing) and Design.

Representation begins with the free pictorial expression suitable to the primary grades and leads gradually to the study of free-hand perspective, and to the reasonably correct delineations of the appearance of natural and artificial objects in the grammar grades.

Design is the study of orderly arrangement, and begins with the simplest decorations of the various objects made by the little children, leading gradually to problems involving more and more subtle relations of form and color.

Working Drawing.—A third type of drawing is working drawing, which shows facts of form by means of the various views, such as top, front, and side views. This is a most important kind of drawing, with which children should become acquainted, but it should be taught, if possible, in the shop in connection with objects actually made. It is therefore omitted as a subject for consideration from this chapter.

Representation in the Primary Grades.—The work in pictorial drawing in the first three grades of school should be an expression of the various childish interests, those of the home, of the seasons with their outdoor sports, and to some extent the illustration of stories from literature, history, etc.

The free use of drawing as a language is perfectly natural to children up to about the fourth year of school. It is exceptional for a primary child to hesitate to draw any subject within his range of interests. He is ready to attempt subjects requiring many objects and figures, and he is little troubled by lack of proportion and perspective effects. Work of this kind should be taken as seriously by the teacher as it is by the children. Criticism at first should be given cautiously. When the drawings of the class are shown such questions should be asked as will lead each child to explain (where it is necessary) just what he meant to say by his drawing. Those drawings that tell their stories best are to be commended, and kept on the bulletin-board for a few days to serve as a stimulus to the class. As the work goes on, simple questions which will lead to a consideration of proportion and

action are not out of place. But if progress is to be made, some definite practice in drawing a selected object or animal from imagination should be given as a class exercise. With the teacher's help and by the study of good but simple drawings, gradually a better type form is evolved. This form should be used in composing various story-telling pictures. A good form to begin with is something as interesting and simple as a rabbit, a chicken, or a duck. The side view should be mastered first, and this alone may be used in making grouped pictures. Changes in the tip of head or body can be made to give variety to the pictures. Probably it is better to teach quite a number of interesting forms in side view by this kind of practice before attempting to introduce foreshortened positions. A study of primitive art would seem to indicate that art developed a long way before foreshortening was attempted.

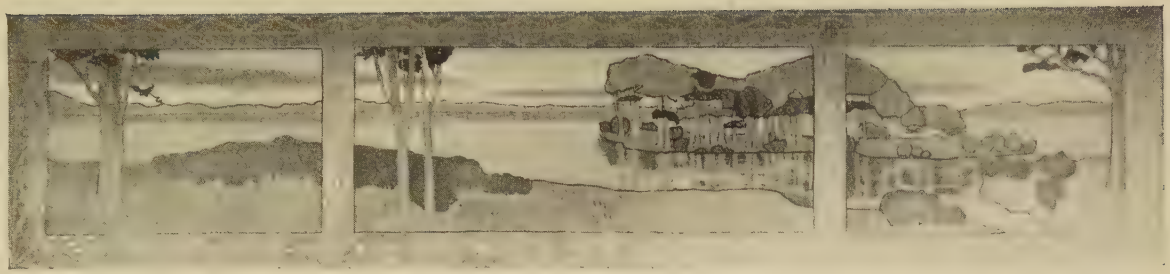
The illustrations of the children should gradually show better drawing, and with some definite help in simple grouping given from time to time the improvement should be steady. But as children of primary age can gain only general ideas of form, very little work from the object seems profitable in these early years. Simple large flowers, as, for example, the tulip and fleur-de-lis, can be drawn from nature in color with childish success, if the teacher leads the class to try only for the larger characteristics of form and color and for general lines of movement. Thus the pictorial drawing in the primary grades should advance gradually.

Design in the Primary Grades.—As with primitive peoples, it is an instinct with children to decorate the things that they make. In school these generally include Christmas candy-boxes, book-covers, valentines, Easter cards, etc. With proper guidance the beginnings of the principles of design can be taught in borders and surfaces, made in time with counting or music. These designs may be done with crayon or brush or printed with sticks. The making of rug designs, when little rugs are woven, offers an excellent begin-

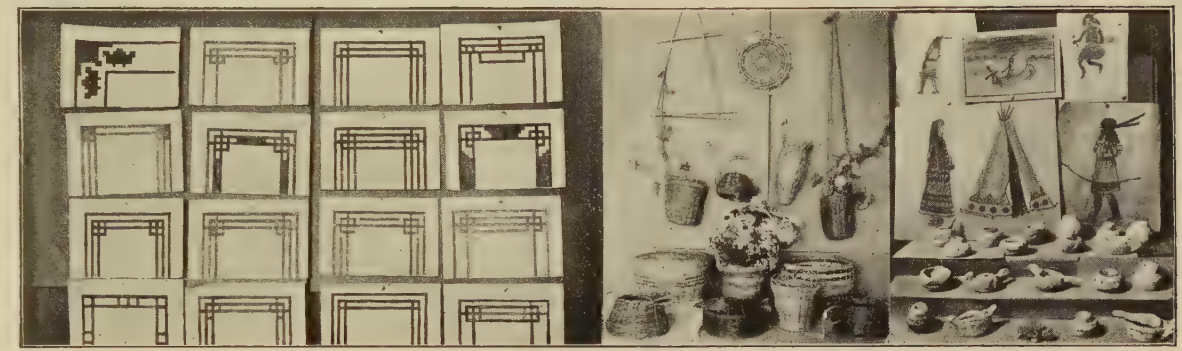
ning in the study of the effect of variety in the widths of the stripes.

Beginning of Color Study.—The use of color in design is most educational where the children are given an opportunity to make a choice within safe limits. For example, in the case of the rug, the materials may be presented in several good colors, such as a grayish blue, a rich red, a golden yellow, besides white and black. The children may then be left to choose one color with black and white for the rug design. The results will be various, and yet no bad combination of color can occur. In studying historic design, we find that the color combinations were usually, at least in part, the result of the limitations in natural material at hand or in available pigments. One explanation of the many inharmonious combinations of color seen to-day lies in the fact that people now are *not* limited in their choice. Hence, to lay foundations for good taste in color, it seems reasonable to acquaint the children with some typical combinations that are good. Later on principles can be taught which will explain how and why certain colors are harmonious.

Representation in the Grammar Grades.—The instruction in representation from the object should become of a very definite character from the fourth grade up. In the upper grades pupils have become mature enough to take some interest in learning to draw correctly and to use materials in a more workmanlike manner than was possible in their primary years. Representation should include the drawing of well-shaped dish and pottery forms, great attention being given to the study of proportion and the character of the curvature. The pupils should learn to represent solidity by means of the correct drawing of the ellipses which show the appearance of the horizontal circles at different levels. They should learn also to show the effect of objects placed at different distances from the eye, as in the case of a group of pottery forms. Study is here recommended of such fine examples of simple object-drawing as are offered by the Japanese



Artistic frieze above blackboard made by pupils in elementary school, University of Chicago



Exhibits of designs, basketry, and study of Indian life. Hackensack, N. J.

sentation of the eighth grade in a class of girls might well centre around the study of the figure and its draping. Here is offered a rich opportunity for the study of Greek casts in connection with a live interest. The principles of Greek costuming can then be compared with a period radically different; for example, that of Charles the First of England, as pictured by Van Dyck.

Design in the Grammar Grades.—The study of design in the grammar grades should generally be in the form of some concrete problem. Such problems are perhaps oftenest presented in school in the demand for a book-cover or portfolio design. This indicates the need that constantly arises for lettering as a part of design. Practice in lettering should be given throughout the grades until considerable skill is gained in making free-hand letters which are essentially classic in character.

Booklets made in connection with some special topic in literature, history, or geography have fully proved their educational value, and they are sure to enlist the interest of the pupils. The making of a manuscript book may quite properly be taken as a problem of the art period in the seventh and eighth grades. No better problem of applied design can be found for the work of several weeks—if each step is taken up with full appreciation of the opportunity it offers. An appreciative study of typical work of the medieval scribes should precede practice in a modernized formal letter suitable for pencil or ordinary pen work. Questions of margins; the importance in the page effect of right spacing of letters and lines; the various good forms of simple initials and versals in color; the illustration of the booklet by drawings or by mounted pictures; the choice of cover paper, and a workmanlike sewing together of the cover and pages; and, finally, the designing of the cover in dignified, built-up letters; all contribute the finest possible training in esthetic judgment.

Other problems in design may be planned to contribute directly to the study of home-furnishing. Border and sur-

face patterns may be designed, cut from the wood block, and printed for curtains, etc. The consideration of the choice of furnishings and the arrangement of a room is a problem that has been successfully taken up in upper grammar grades. In some cases the actual rooms have been furnished in the school-building or elsewhere. Some of the articles in such cases were selected by the pupils from the store, while others were made by the pupils in school. Where such a scheme is impracticable a valuable study in home-furnishing can be made from carefully collected pictures of interiors good and bad, the pupils finally deciding upon good arrangements and color schemes and working them out in pencil and water-color.

Color in the Grammar Grades.—The use of color throughout the grades should occur wherever a problem in design demands it. Enough formal training should be given so that pupils can think of color clearly in its three qualities, hue, value, and intensity. Examples of fine harmonies of color in the art-museum collections of textiles, pottery, and painting should be shown the pupils where opportunity allows. Any intelligent teacher can collect from the best magazines pictures in color which illustrate fine harmonies and also natural examples of beautiful color combinations, leaves, shells, feathers, etc., not to mention other sources of good examples for the school collection.

Picture Study.—From what has already been said, it will be inferred that any course in picture study which would require study of the work of a given number of artists or pictures is too formal. It is doubtless a desirable thing for all children to become familiar with as many of the master works within their range of interests as is possible, but true art appreciation does not grow because of the number of things seen, nor as a result of knowing the facts of many artists' lives. It seems to us that all little children should know the animal pictures of Rosa Bonheur and of Sir Edwin Landseer, and that Corot's landscapes and Millet's people of the fields should be familiar to the older ones. The stories of the lives

of these artists are helpful in giving a key to the aims which they kept before them in their work. The work of some of our best American painters ought to become of living interest to the older pupils, and, if possible, they should be given opportunity to see examples from time to time in the many exhibitions of contemporary painting which occur throughout the country. The purely artistic study of pictures and other works of art has already been referred to as something that should take place in connection with the various art lessons.

Exercises in copying may be given, and in making notes in the study of line, "spotting," color, and other qualities. Thus principles may be illustrated and a genuine study made of the structure of pictures.

Developing an Interest in Architecture.—A beginning of an interest in architecture may be made by leading the children to observe the best buildings in their own cities or towns, and to see as far as possible wherein their beauty lies.

III. Handling the Class

Size of Classes.—The size of classes for drawing should, if possible, be small. Over thirty-five is a number too great for effective individual criticism. As small a number as twenty is much better to deal with. Many teachers must teach classes of forty and more. Many do even this feat exceptionally well.

Materials.—The materials best suited to primary grades, besides paper, are colored crayon, scissors for cutting silhouettes, brush and water-colors, and clay. If resources are limited the colored crayons may be used for most of the work recommended. Pencils are needed occasionally, but for primary illustrative work and design color is desirable.

In the grammar grades, brush and water-colors serve better than crayons for many types of work. The lead-pencil becomes more and more the important medium as the work advances.

Care of Materials.—So far as possible each pupil should keep and care for his own materials. This, however, is an ideal which it is impossible always to follow. Water-cups, for example, had best be distributed with the water in them for the lesson, and collected after the lesson, to be emptied, rinsed, and dried.

As pencils should be kept in perfect order, it is wise to collect these after use, and have them looked over and repaired ready for the next lesson. Each pupil, however, should have his own pencil. The best way of distributing materials is through the help of a selected pupil for each row.

Presentation of a Drawing Lesson.—In presenting a lesson in drawing it is important to remember that it is a *common error for the teacher to talk too much*, and to ask too many questions requiring verbal answers from the class. At the beginning of a drawing lesson the problem should be presented clearly and briefly. Generally examples of the type of work to be aimed for should be shown. Then with little delay the children should be set to work. They are to express their ideas in graphic form and naturally they are impatient to begin.

Individual Criticism.—Individual criticism may begin as soon as it is needed, the teacher passing quickly around the class first to see that all are working in the right way. With the younger children the suggestions should be very simple and deal with but one thing at a time. In the case of the older children the criticisms should be more detailed, and given, where possible, in the form of questions such as, "Is your vase too high or too broad?" The pupil may thus be led to see his mistake at once. Where a lesson in design is being conducted and the class is busy at work experimenting, the best plan for the teacher is to remain at her desk and ask each pupil to come to her with his design.

Class Criticism.—Class criticisms are most valuable and should occur often, at least after each problem has been

worked out. The drawings of the class should be put up where all can see them. If necessary, the pupils leave their places and go up close enough to look at each drawing carefully. The best, second best, etc., are then chosen by vote of the class, the teacher putting down the number of votes cast for each drawing. Sometimes it is best to consider only certain qualities (as drawing, color, or composition) in calling for a vote. The teacher in any case guides the pupils' observation by a few clear questions before they choose. After the class has made its choice, the teacher gives *her* decision and states her reasons for the choice she has made. Continued practice by a class in judging its own drawings is a most valuable means of developing right standards.

Motives in Lower and in Higher Grades.—In the primary grades the immediate interest in the subjects of representation is quite sufficient as a motive. In the design, the desire to beautify the objects to be made is strong enough to hold the attention. Throughout the grades it is well to keep the art work in touch with vital school interests. This is not difficult in the subject of design, but is not always possible in the study of representation. More and more as the work advances, the doing of the problem in hand as well as possible will become a sufficient motive where the true art spirit has been developed. This can be said without danger of being misunderstood by those who have read the chapter with care. For throughout the thought has been reiterated that rightly conceived art study connects with the school work on all sides. To deny, however, that it has its own special values and power of appeal to the pupils would be to give it an inferior place in the curriculum, a place it cannot take.

SUMMARY

1. One of the chief aims of art work in schools is to promote avocational efficiency through esthetic appreciation.
2. Participation in the creation of art products of some kind is necessary to develop appreciation.

3. We are interested to-day in making the entire environment a place of beauty and a joy forever; indeed, we strive to make of living itself a fine art.
4. A very wide range of activities and subject matter in the form and color arts is thus available for instruction purposes.
5. A survey of the work throughout the grades shows that representation (pictorial drawing) and design are the two chief types of subject-matter.
6. Both representation and design should be carried through the grades as suggested. Creative, or story-telling drawing should be given its proper place.
7. The suggestions offered for handling classes relate to careful planning and routine execution with reference to selecting and getting ready materials, avoiding too much talking, and encouraging individual and class criticisms.

PROJECTS IN APPLICATION

1. What do supervisors of drawing and design find as the chief weaknesses of new teachers? Of experienced teachers? Classify the ones you discover.
2. How may these be prevented?
3. Learn what set of books and other aids are of most service to a teacher in the type of school in which you are to teach.
4. What publications of the U. S. Bureau of Education at Washington, D. C., give help in cultivating a taste for beauty in life through drawing or other means?
5. Read Sargent's "How Children Learn to Draw."
6. Visit the homes of your pupils and quietly observe what could be done with little cost to bring more beauty into their homes if they and their parents only had the knowledge and cultivated taste.
7. What are the best pictures for the various grades to be hung on the wall? How can you learn that they best suit the children?
8. Learn what Thorndike and others have done to measure esthetic appreciation. (*Journal of Educational Psychology*, November, 1916.)
9. Get the latest drawing scale by Thorndike (Teachers College, New York) or others, and try to measure pupils' art work.
10. How are we going to tell what types of art work are of most worth educationally?

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CHAPTER XIV

MUSIC

Preliminary Problems

1. If we train for knowledge and skill, does it necessarily follow that taste for music will result without further thought, or must the pupil's capacity for enjoyment, and, consequently, his taste, be a specific aim in music teaching?
2. Formulate an aim for teaching music that will be a guide for a teacher, showing that you have considered the problem in question one.
3. Give reasons based on the nature of music, and taking into consideration the nature of the child, why the rote song should be made the foundation of school music.
4. Can you think of reasons why different sides of the pupil's nature should be appealed to at different ages? How would such changes in age be likely to affect the subject matter?
5. Can it be sound, educationally, to have the pupils memorize songs, the meaning of which they do not fully grasp?
6. Which one of the five great aims of education given in Chapter I may music teaching especially promote?
7. In what ways do people in your community satisfy their love of music?

The Problem.—It is said that one of the questions that schoolmen of the Middle Ages loved to discuss was: "How many angels can dance on the point of a needle?" No doubt it took great learning and logic to carry on such a discussion, but it fails to interest us, not because we do not care for the learning and skill exhibited, but because the number of angels who could dance on the end of a needle has no value for us.

There is a sharp distinction between interest in a subject such as the schoolmen had and interest in a subject because of its practical worth. It is this worth of the subject that is

emphasized by the modern school critic who says: "Granted your Latin, arithmetic, and language are well taught, what is their value after the pupil leaves school?" A new and exacting standard is being set up demanding that all school studies shall prove their worth, whether for the work or the enjoyment of life.

There is no doubt but that music is for life's enjoyment, and, therefore, this end should be the aim of school music. If we ask a mother, "What do you want your child to receive from his school music?" she may answer, "The ability to read music," or "The ability to sing better," but these are only means in her mind for accomplishing what is her real desire, namely, that her child shall enjoy music more; and, secondly, that the enjoyment should be of the best music. That is, she would require improvement in taste and judgment as well. She desires her child to have a fine type of wholesome enjoyment and an educative use of his leisure. In short, parents of school children, if they could state in abstract terms what they desired most as the result of the music teaching of the schools, would say: "We wish our children to increase the quantity and improve the quality of their musical enjoyment."

All teachers agree with these ultimate aims, but they disagree as to the means and methods to be employed to reach such results. What intensifies the disagreement is the little time allowed to music in the school program, limiting the choice of what shall be taught to the most important thing for accomplishing the aim. One says, "The singing of songs is to be desired, but the essential thing is sight-reading"; another says: "The knowledge of notation is valuable, but good voice production and expression is fundamental." Having settled in their minds the methods to be used, they become so engrossed in accomplishing these technical ends that they forget the purpose for which they are done. The result is that the child who is studying music is apt to feel as little connection between his do, re, mi's, or vocalization,

and an increased pleasure in music, as we feel between the dialectical skill in the discussion of the dancing angels and every-day living.

Arithmetic, geography, and language are for practical uses, but music has no such value, its enjoyment being the reason for its existence. Wholesome enjoyment, or avocational efficiency, has been given by the editor in the first chapter as one of the five factors of social efficiency, the aim of education. Thus the cultivation of pleasure in music is not only vital to the subject but peculiar to this subject alone. A reason can always be given for demanding attention to other studies. However little a child may feel the need of such subjects, he will accept the statement that they will be useful in after-life. No such motive can be given in music, except as we show that harmless recreation and right uses of leisure are important aims of life. If the child does not feel the satisfaction at the time, the subject is practically worthless to him.

This brings us to the fundamental problem in teaching music: how to cultivate an affection for the subject, and at the same time accomplish the drill necessary for skill. Two main lines of procedure are recommended: First, singing tending toward knowledge and skill; and, second, listening tending toward taste and judgment.

I. Singing Tending Toward Knowledge and Skill

A. **From Song to Notation.**—In order to gain sufficient elasticity for classification, it will be well to treat the first three grades as a unit and to consider them in seven steps.

1. *Selection of Songs.*—The first step that we shall consider deals with the selection of songs. The child's remarkable power to sing by imitation, or by rote, makes it possible to introduce him to the most beautiful melodies of the art, without requiring any technical mastery. This makes the period extremely valuable for storing the pupil's mind with

those songs the singing of which will be a pleasure all his life. This thought should govern the selection of songs, not limiting them to childish ditties that he would be ashamed to sing in the upper grades, but including classic gems of the art, the acquaintance with which will form the basis of his musical taste and appreciation.

The argument that the child does not understand what he sings about, or that the love and jollity in some songs are not appropriate, has little meaning if the songs are such as live from generation to generation. They must have a value that has preserved them, that will far outweigh any incidents in their expression that might be beyond, or unsuitable for the child. This is not asking any more from the child, nor nearly as much as we do when we read the Bible to him. Storing his mind with the literature of fine music is quite as important in satisfying his esthetic needs as filling his mind with Bible stories his religious needs.

2. *Awakening Musical Interest.*—The second step deals with the value of the rote song as a means for awakening the pupil's interest in music. He learns to sing and enjoy music before any technical problem is presented to him. We have seen in our introduction how important this awakening of interest is for a successful carrying on of this study. If the rote-song work has been rightly done, the technical work will be greeted with pleasure as a means for still further satisfying the interest awakened.

3. *Thoroughly Memorizing Desirable Songs.*—The third important step in this early song work is the memorizing of songs worth while. Music, unlike all the other arts, except poetry, depends on the memory for its coherence. A beautiful melody means nothing, moreover, if at its close we have forgotten the impression of its beginning. Such memory work must be systematically done, and the songs that are to last through life must not only be repeated, year after year, but sung individually. The laws of habit here are the same as in other subjects mentioned in former chapters. This drill

is of the utmost importance, for the value of these songs is to be measured in after-life. It is as an individual that each will have to remember them, and only as individually remembered will there be any valuable deposit of usable songs.

There is nothing more absurd in our educational system than limiting work in music, as is almost always done, to concerted singing. No other subject would be remembered if recitations were made in concert by the class. If the child did nothing more than learn twenty first-class songs, so that he had them as his own equipment, proved by the ability to sing all the stanzas through by himself, the work in music would be justified and a basis laid for further musical development.

4. *Learning to Use the Voice Expressively Through Song.*—The fourth step in relation to the rote song is the opportunity it gives to use the voice expressively. No art is produced as correctly with so little conscious technical training. A musical child of three can sing a song perfectly. Music is preeminently an art of the public schools, for it gives a maximum of opportunity for expression, with a minimum of technical skill, because proper tone and phrasing are acquired at this early age as a reflex to a desire to express the thought of the song. The pupil is not conscious of how he does it, for his mind is entirely centered on the effect to be produced.

5. *Developing Musical Discrimination.*—The fifth point is the development of musical discrimination. The first four steps described above would be sufficient if music had made no further progress than that represented by the folk-song, and for the majority of the population this would be enough, but music has developed very rapidly. It has added, we might say, another story to its tonal structure, for the comprehension of which a keener discrimination is necessary than was sufficient for "the people's art." This discrimination is most effectively acquired in the practice necessary for singing from notes. At the same time the skill gained is of great practical value in extending our power of musical enjoyment. Read-

ing music, however, is so little used by the general public that the only justification of the severe training it requires is the increase of our power of musical enjoyment due to the discrimination developed.

This change of aim alters radically the character of the work and the method pursued. Instead of emphasizing sight-singing at first, attention is drawn to the structure of the music, and the pupil's mind is stimulated to observe more keenly. For instance, commencing with the first song learned, the pupil is led to observe the characteristics of its movement. The most natural way for the child to define this movement is in some form of physical motion; it may resemble more nearly primitive dancing, where gesture and pantomime, as well as movement of the feet, are utilized to express an idea. Physical movement is the most natural ally of music and expresses its ideal motion better than any other means. Movement being in both space and time, is much more easily observed and analyzed, hence is a natural medium for passing from a purely ideal expression of motion, such as music limited to time, to its representation in notation—an expression limited to space.

6. *Learning Notation.*—This leads eventually into the sixth step, the learning of the notation that indicates the observations made in the previous step. This notation work is more for connecting the sign with the tone and not a drill for giving skill in reading at sight. After a child is able to show the direction of a melody by movements of his hand, he is quite able to picture this movement by long and short dashes and up and down positions, showing his observation of relative differences of duration and pitch. Notation can easily be introduced in such a manner that it will carry the intelligence of even the most unmusical pupil of the class. Thus not only is the significance of notation better learned, but habits of observation of musical motion are developed that will be of the greatest value in listening to the complex movements that are combined in modern music.

7. *Song-Making.*—The seventh and last step of this period is song-making, and consists in putting to practical use the knowledge gained in song-singing and notation, thus utilizing both branches of the technical work that have been developed from the rote song. Little children enjoy making up short songs. Such work utilizes all the child's musical experience, and also appeals to his constructive imagination. There can be hardly any activity in this study that will be more productive of truly musical results than his attempt at first expressing in tone a suitable melody for a given stanza of words and then defining its general melodic outline, such as the metre, duration, and pitch. He may do this by acting and using the blackboard in the earlier stages, and later by giving much of the notation.

Such work needs skill and preparation on the part of the teacher. It should not be thought because of the emphasis on singing by imitation and the very elementary technical work required, that the teacher needs but little equipment for this portion of music teaching. The fact that so much of the work must be done as a reflex to a right stimulation of the child's mind requires the subtlest form of the teaching art, as well as a thorough study of the material and its application. Unfortunately, ordinary sight-singing can be done so mechanically that there is a low ideal as to the grade teacher's responsibility and preparation for music teaching. An intelligent teacher can easily grasp the routine of sight-singing, but it takes artistic perception and considerable vocal drill to do adequately the song and creative work.

The importance of this equipment is recognized on the continent and in England by paying a higher salary to teachers who add this equipment to their other training. Such teachers assist those less prepared, by teaching the music in their grades.

To sum up the work of this period: If we glance over the seven steps we shall see that by focussing the work on actual song-singing we accomplish two important ends with reference to increasing the quantity and quality of our musi-

cal enjoyment. First, we supply the child with a musical experience and a repertoire of song that will be a joy to him all his life; second, from these songs we develop the necessary technical training along two distinct lines: that of song-singing, developing all the arts of expression, and that of notation, developing musical discrimination and leading to the ability to read music.

Following are the seven points:

1. Selecting songs.
2. Awakening musical interest through song.
3. Memorizing desirable songs.
4. Learning to use the voice expressively through song.
5. Developing musical discrimination.
6. Learning notation.
7. Song-making.

B. **From Notation to Song.**—In this period, including the fourth, fifth, and sixth grades, the approach to notation is the reverse of the earlier. In that we went from song to notation; in this the process is from notation to song. This is approximately the age in which drill work in other subjects is most effectively accomplished, and it is pre-eminently the time when the necessary speed work and concentration for successful note-reading should be done. Competitive skill appeals most strongly to the pupil when his budding self-consciousness will not allow him to take those frank, poetic aspects toward interpretation in song-singing and creative work that the earlier period made possible. It precedes the adolescent period and is a much more favorable time for developing a technic which we wish to make automatic than is the later period, when the intellectual and emotional nature demands a more mature treatment. In the earlier period the musical thought came from imitation, and its relation to the notation was evolved only gradually. In this period musical thought is formed directly from the notation by the pupil himself, its accuracy being tested by the music produced. In the first period ideas represented by the notation

were gradually formed; in this period a technic is developed that shall apply these ideas by means of the notation, to problems of note-reading.

These problems present two aspects: First, the necessity for speed in recognizing what the notation calls for; and, secondly, the ability to produce at once what is recognized.

1. *Speed in Notation Work.*—The notation aspect is often confused through comparison with language, the notes of the staff being thought of as letters, and their combination as syllables and words. A better comparison of the seven tones of the scale is with the nine digits in arithmetic. The function of both notes and digits is to express relationships. As we have to be familiar with the multiplication table in order to be able to apply it to actual problems, so we have to be familiar with the important relationships that the notes present before we can interpret them with sufficient rapidity to be able to conceive and sing what they call for without interfering with the movement of the music. This problem is made difficult by our notation, which presents to the eye the same tonal relationship differently in every key, thus necessitating an eye-training. This is as mechanical a problem as the multiplication table, but with this peculiar difference, that it demands speed for successful use. To know that the third line of the G clef represents the second tone in the key of A is of no value if we have to take an instant of time for determining it. It must be recognized at once and related to what precedes and follows. Hence, speed in the recognition of intervals is a distinct technic that must be developed. It is wise to follow the example of arithmetic and teach the representation of intervals in keys by notation, independently of their tonal significance, as we do the multiplication table, independently of its practical application in examples.

2. *Music-Reading by Phrases.*—The music-reader must know how the music goes before he can sing it musically. It is obvious that the reading of single notes, one after the

other, would no more make possible fluent reading of music than the reading of single letters in a word would make smooth reading of language. This ability is even more necessary in music where the grasping of the movement of a phrase helps us quite as much in singing the intervals as the grasping of the intervals helps to form the phrase. Therefore, with the development of speed in interpreting the signs of notation there must be developed the parallel technic of thinking music musically, that is, by the nature of its movement, the motives and phrases that make up its periods.

3. *Key Groups; Minor Mode; Cadence Chords.*—Besides these two fundamental lines of work that will be prominent in this period, there are certain facts of the musical art that will grow out of the song material used. The pupils will discover that with their growing skill in reading, the music has grown more difficult. The songs, instead of remaining in one key, modulate to related keys and back again. Such changes are so systematic that it is of great value in reading to have the ordinary relationship of keys, such as those of the tonic, dominant, subdominant, and their relative minors explained to the pupils by means of the characteristic tone that introduces each key. For instance, in the change to the dominant, the fourth of the old key becomes the seventh of the new.

The second important fact grows out of the use of minor songs. After considerable practice, especially of minor folk-songs, it is well to construct the scales and study the minor mode.

Pupils in this period will be singing many two and three part songs. To study the cadence effect of the tonic, dominant, and subdominant chords as they occur in three-part singing will help develop a musical ear. Such practice is given by separating the room into three choirs, each choir singing each of the tones of the triad, thus having an opportunity to become familiar with the voice leading of these chords in cadence form.

4. *Memory Songs.*—All of the preceding technical aspects of music grow out of the songs, so that the main work of this period, as of the first, is song-singing, but with this difference that, while the songs of the first period were largely learned by imitation, those of this period are learned by means of the notation.

This is not done in a slavish way, merely to read, but the technic demanded by reading is used for quickening musical perception. Thus the fundamental aim of the work is kept in view. With this the pupil's repertoire is increased by eight to ten more songs, so thoroughly learned and of such fine quality that they will be a joy to recollect and sing long after school-days are past.

To sum up what we have attained in this period:

1. Speed in notation work.
2. Music-reading by phrases.
3. A knowledge of key groups, minor modes, and cadence chords.
4. The memorizing of songs.

C. **Broadening Musical Experience.**—The third unit, covering the work of the seventh, eighth, and ninth grades, which are often now classified as the junior high school, is a continuation of the first line of procedure, which starts with song-singing, and leads into technical voice production and note-reading. There is, however, a change in the subject of study as well as in the method pursued, due to the changing nature of the pupil, who is now passing into the adolescent stage and requires a broader appeal to maturer sympathies and interests. The competitive work with technical drill of the previous period grows irksome as he reaches this age. His emotional nature, sensitive to the regard of others, makes him unwilling to do anything that is not significant. He demands at this age an emotional content in his musical activity more nearly corresponding to the demand of a mature person.

A second reason for changing the character and method of the work grows out of the conditions of school life. A large proportion of the pupils leave school at the end of the sixth grade. Those who continue include the group that goes on to high school and college. The leaders come from this group, and they should be given a wider musical training. The work so far has been in singing, with the technical aspects of voice and reading that grow out of singing. But the experience of the future citizen will be more largely with the instrumental rather than the vocal side of music, since instrumental works predominate over vocal, in number and in artistic worth. It is eminently fitting that the school should prepare the pupil for this musical heritage; hence, the characteristic work of this period will be devoted to the instrumental aspects of the art. It will be presented in five steps.

1. *Review of Previous Knowledge.*—The first step will be to review the knowledge gained in the previous periods, so concisely that it will stay with the pupils the rest of their lives. This review is essential not only for those who have done the work, but for those who enter the upper grades, coming from places where no music has been taught. Such a rapid survey puts them in touch sufficiently with the previous work to enable them to join in the choral work of the upper grades.

2. *Chorus-Singing.*—The second step is a systematic development of part-singing as well as unison and solo work, taking up the larger songs, cantatas, and suitable choruses from classic works. The aim is primarily to introduce the pupil to the best vocal literature and at the same time develop ideals of production by working some of these up for school functions, such as graduation exercises. Chorus work should not be limited to perfecting every piece practised, so that it can be performed publicly. The student should be given the opportunity to become acquainted with many gems, while increasing his reading ability.

3. *Musical Instruments.*—The third step prepares for instrumental music by drawing attention to the instruments themselves, considered in the three great groups of wind, string, and percussion. Such work correlates well with the manual training and art work of this period. This broadening of the subject to include a study of instruments, covering the field from the primitive willow whistle to the elegant harp, makes a fascinating appeal, entirely different from the vocal, and frequently interests pupils in the art, especially boys, at this age of vocal difficulties.

This interest may be developed along two important lines: that of playing orchestral instruments, and the study of instrumental forms. Studying about instruments and seeing them often awakens a desire to play them. This is the time to encourage the formation of school bands and orchestras. Many pupils that are vainly attempting to play the piano would get more pleasure from their music if, instead of practising such a difficult solo instrument they would take up one of the orchestral instruments, such as a flute, violin, or clarinet. A group of ten or fifteen players, united, will produce music well worth hearing, much as a chorus is interesting, when the solo work of an individual in either group would not be worth listening to. To encourage the playing of such instruments may not only give a boy or girl a delightful life hobby, but will make him a valuable asset to the social life of the community.

To do effective work in high-school orchestras, a boy should commence his instrument at least in the seventh grade. There is, however, this essential: many of the instruments necessary for an organization, such as the double bass, drums, and some of the horns are not such that a parent would be willing to spend money to buy them. The custom is becoming common for schools to own these instruments and lend them to students showing talent. This proves an encouraging factor and often insures a good school orchestra in a town where otherwise none would be possible. Such work inter-

Combination 7th and 8th grade orchestra, ages 12 to 14. Los Angeles public schools

Junior orchestra, ages 6 to 12

ests instrument players of the community in the school and enlarges the appeal made by school music to the general public. It often helps a pupil to discover a talent that may lead to professional work.

4. *Instrumental Forms.*—The fourth step is the study of instrumental forms. The interest awakened in instruments and their playing naturally leads on to interest in the music produced. To start with, this may be no more profound in style than dance-music. If, however, it is good of its kind, it makes a valuable introduction to the simpler musical forms. The pupil has an opportunity to study the effectiveness and essential need of repetition in music, and begins to realize the significance of a theme or motive as a text of the composition. As the more classical types of music are taken up, whether by actually playing them or by hearing them on disks or rolls, it is possible to increase the interest to include studies of the sonata and fugue forms. By such study pleasure in listening to them will be greatly enhanced. This study of design in music correlates effectively with design in the other arts and proves of invaluable worth in awakening interest in beauty of symmetry and design in general.

5. *Instrumental Work Outside of School.*—The fifth step considers the value of instrumental work done outside of school. There is a tendency in leading schools to give credit to well-authenticated instrumental work done with private teachers. This makes it possible for many a talented girl who has worked up a technic on the piano to a point where it would bear fruit, to continue it and still not be overworked by her school studies. The granting of such credit by the school means considerable attention to records and examinations. It is worth while, not only in justice to the pupil, but also for what the pupil can contribute to the social life of the school through her art. It has value for the private teacher whose work thus tends to become standardized.

II. Listening; Tending Toward Taste and Judgment

We have so far considered the work of the nine grades in groups of three periods. Starting with song-singing, the work has led to knowledge and skill, and has added to vocal work in the last three years a study of instruments and instrumental music.

The New Opportunity Afforded by Disks and Rolls.—This would be all that could be attempted under school conditions were it not for the invention of player-pianos and talking-machines which have made it possible, through rolls and disks, to hear instrumental compositions and songs that were beyond common reach a few years ago. It would seem almost criminal, therefore, not to use these aids for widening musical experience. In fact, progressive schools all over the country are doing so.

A. Selection of Music.—The use of such devices for hearing music, selected so as to develop good taste and judgment, is an obligation as important for the school as the forming of taste for good literature. In fact, the attractive nature of music makes the growth of a low and coarse taste easier than in the case of literature, so that there is greater need for counteracting such an influence, not to speak of the value in the enjoyment of music that would come from a cultivated taste.

The effectiveness of such music teaching through hearing depends on the success with which the teacher can get the pupils to listen attentively. We must have some way of focussing attention—in other words, give the pupil something to explain which will show the way he is listening. For this purpose the first essential is that the music selected be of a nature that lends itself to fairly broad and definite interpretation.

B. Facts Concerning What Is Heard.—Second, the teacher should relate such facts concerning the setting of the music as will tend to awaken interest in it in the mind of the pupil.

C. Problem to Be Solved by Listening.—Third, and most important of all, the teacher must present a problem to the pupil to solve, at the same time not limiting the pupil's own imagination or forcing him to see things in the music he hears that may not be true to his experience. For instance, with younger children of this period, the request to have them, as fast as they imagine what the music says, skip forward and dance it in the open space before the desk, immediately makes them listen to the music with an intensity that they otherwise would not have. At the same time the attention is not fixed on technical matters of form, but on what is suggested through the imagination. Thus the pupil's own imagination is stimulated in relation to the music. The same thing occurs if a series of, say, three or four pictures, more or less descriptive of the moods of three or four pieces, are placed before the pupils, and they are asked to name which picture would go best with which piece of music. Or, again, the names of a number of little pieces could be given, such, for instance, as Schumann uses in pieces for children, and the children asked to state which name would go with which piece. Inquiries with reference to the reason a choice is made would show vigorous, attentive, and imaginative listening going on. Or some romantic piece of music could be played, the poem or title that accompanies it being first read and the pupils asked how such designation was justified. Correlation with other subjects could be brought in. For instance, pupils might be asked to suggest poems or stories appropriate to what is heard, or tell what kind of a picture would make a good cover design for the music.

While in the above work the player-piano would perhaps be the most convenient to use, records of instrumental compositions on the talking-machines would serve to a large extent. The wide field of song-music that the talking-machines present gives an opportunity for the student to tell why a given accompaniment and melody go with a given text. A good illustration is Schubert's "Erl King." Such practice

would quicken a lively interest in art songs and illustrate the expressive use of instrumental material. Not only this, but in records of the folk-music of foreign lands, excellent opportunity is given to get the spirit of these people in their songs. After a Russian, Hungarian, Scandinavian, or Italian folk-song, the pupils' powers of observation are taxed when asked what characteristics of the people these songs portray.

It will be seen that in all this work there is required a playful exercise of the imagination. We are in the world of make-believe, not fact. The music does not tell a concrete story or give a definite picture, any more than the clouds that gather around the setting sun are intended to express definite shapes; but it certainly does not injure our enjoyment of the sunset to allow our fancies to play with the shifting forms that its colors light up. In music similar imaginative play induces concentrated attention and listening.

Not only does the music heard impress itself on the mind through such effort, but in the statement of his interpretations the pupil is required to express himself in relation to the beautiful in a way that should cultivate his appreciative power as well as his use of language. A pupil will learn the difference between vapid and insipid, and vigorous and imaginative music, and widen his power of healthy enjoyment.

The difference in character of this sort of work from the vocal will suggest the value of having it done at a separate time. A period once a week, or a few minutes daily, for such appreciative work will be time well spent in the musical education of the pupil.

The success of the work depends much on the sympathetic attitude of the teacher. Her interest and enthusiasm in the composition being heard is worth more than all other factors combined in forming the taste of the pupils. Hence, different teachers need different materials.

As technical difficulties in production do not limit what can be done, the sole classification must be based on the appeal that the music makes to the pupil. Here the good

judgment of the teacher is of the utmost importance. Generally speaking, it would be better to pass from music of the romantic or program type, like the music of the "Peer Gynt" suite, or Mendelssohn's "Midsummer Night's Dream" overture, where the accompanying idea is fairly definite and vigorously felt, to those more subtle compositions, especially of the classical type, that require experience both of life and of music to be comprehended.

The principles suggested, plus the enthusiasm of the teacher, will accomplish more than any attempt at classification of material apart from the pupils for whom the classification is being made; for if in any subject the taste and capacity for comprehension of the pupil should be considered, it is in this appreciation work.

To sum up: Selection of material will be as various as there are pupils and teachers making such selection, but the principle with reference to method must be kept constantly in mind in the conduct of such appreciation lessons. These principles are:

A. The selection of music.
B. Facts concerning what is heard.
C. A problem to be solved by listening.

III. School Music and the Community

The music training in the schools has so far been considered under two main heads—one emphasizing singing, the second emphasizing listening. Out of the first has grown technical knowledge and skill; out of the second has been developed the power of concentrated listening, appealing to the imagination and developing taste and judgment. There remains one further consideration; that is, the relation of the music of the schools to the community.

We saw in our introduction that the ultimate aim of school music, if it could be stated in abstract terms, would be to increase the quantity and improve the quality of musical

enjoyment, and that the test was not that this should be done merely for school-days, but that it should continue to bear fruit in after-life. This means that the work of the school is to be tested largely by its effect in the community. To this end the school should make definite plans. There is already a movement toward the greater use of school-buildings. One such use effectually carried on in Paris requires the supervisor of music as a part of his work to give two evenings a week to conducting choruses made up of former pupils who are now a part of the community. Such use of the school-buildings for musical purposes gives one of the most valuable motives for the work of the school. Pupils see their older brothers and sisters getting a satisfaction and pleasure out of music that they feel they will have if they are diligent. Such work interests the community at large through the recitals and concerts given, and affords a practical illustration of the accomplishment of the school. It gives a delightful opportunity for artistic and healthful use of the leisure time so sorely needed in our larger towns. It makes possible correlation with dramatic work and folk and artistic dancing that will make the school the place most beloved by the community. In this way the school will supply one of the most needed elements for developing social life.

As we have stated the purpose of music to be the increase of life's enjoyment, the school that carries its work on into the community is the one that will best accomplish this noble aim.

SUMMARY

1. The effective aim of all musical activity in school is to increase the quantity and improve the quality of the pupils' musical enjoyment.
2. In pursuit of the above aim, the musical activity of the school is conducted along two complementary lines, the first primarily singing, developing knowledge and skill; the second mostly listening, cultivating taste and judgment.
3. The singing activity of the school presents two aspects, the first vocal, memorizing of song gems as a part of one's permanent

Using a phonograph for physical training at Minneapolis

A group from pageant of "The Seasons" during commencement week at the State Normal School, Lock Haven, Pa.

mental equipment, and developing skill in singing these songs with good voice, expression, and articulation.

4. The second aspect of singing is learning to read music, this quickens the power of perceiving what is heard, necessary in learning notation, and develops knowledge of the science of music.
5. Growing out of and necessary for skill in reading music, is drill for cultivating automatic responses to notation, conducted as speed work.
6. The second complementary line of musical activity, learning to listen, more than doubles the pupils' field of musical experience, through the systematic use of instrumental music. This presents two aspects of work, the first conducted largely by means of reproducing instruments, the second includes the use of instruments themselves, both individually as in the use of the piano and collectively as in orchestral practice.
7. The activity in listening to music stimulates the imagination, develops power of concentration, and cultivates a discriminative use of language, all in the field of music.
8. The educative process in teaching to listen is first to produce a keen enjoyment of what is heard, through a careful preparation of the class beforehand with reference to the origin, structure, and value of the music; and second, presenting a problem to be solved, based on the pleasure experienced, such as, for instance, to suggest a name or picture for the composition, or to act or dance its motion, or to describe its mood through the use of any human experience.
9. The second aspect of the listening work, namely, that including the use of instruments themselves, heightens the power of listening through knowledge of instruments and the technical skill gained through practice, especially where this is carried on in groups requiring the player constantly to listen to the effect of what he is producing in relation to those with whom he is playing.
10. The school may cap its effort to increase the quantity and improve the quality of the pupils' musical enjoyment by supplying the most powerful motive within its reach, namely, by giving concerts and recitals open to the whole community in which gifted pupils, graduates, and outside musicians may take part, thus supplying a worthy goal as an end of all musical instruction, and a widened field of musical experience for every one.

PROJECTS IN APPLICATION

1. Give reasons why it is well, before the regular notation is commenced, to draw attention by action and diagram to the movement of melody and tone.
2. Why is memory so important in teaching music? Give reasons due to the peculiar nature of the art; and others due to the social requirements of the pupil.
3. Give reasons growing out of the nature of music; modern inventions; and the need of the pupil for including instrumental music as a part of school work.
4. How can listening to music be made intensive and valuable as a school exercise? What important educational ends are accomplished by such work?
5. Why is it valuable for the pupils, as well as for the community, to have the resources of the school, including the buildings, used for the musical benefit of the general public—a sort of continuation work in music?

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CHAPTER XV

NATURE STUDY

Preliminary Problems

1. Think through your usual daily routine of activities to see how much you depend on devices that use the forces of nature in their operation.
2. Do you understand the method of operation of such devices?
3. Have you ever been forced to know how things behave in the ordinary course of nature in order to make use of them, and has your success in the particular instance been in proportion to your knowledge?
4. How have you learned what you know of natural phenomena? Has the school contributed to this knowledge?
5. Do you enjoy the out-of-doors? Is such enjoyment desirable?
6. Do you possess this enjoyment because you know considerable about natural phenomena or because you have come in contact with some person whose contagious enthusiasm gave you your attitude of mind toward nature?
7. What elements of this appreciation of nature can be imparted by school instruction?
8. What is the most perplexing question you have had to decide recently?
9. How did you go about it to decide it?
10. Are you conscious of a right method of going about it? How can this scientific attitude and habit of mind be imparted in school so that it will function in life?

The End to be Achieved in Teaching Nature Study.— Surely it would be well to arrive at a clear concept as to what one is trying to do before he sets out to do it. At the outset the nature-study teacher is confused by discovering, as she reads the various books and articles on nature study, that there is no single aim on which all are agreed, but that various aims are emphasized by various authorities. We must therefore discuss not the aim of nature study, but

The Aims of Nature Study.—The more important of these may be tabulated somewhat as follows:

I. *Social.*—(*a*) To teach the child such facts and principles of nature as will make him more efficient in the community.
(*b*) To give the nature-study approach to personal hygiene.

II. *Individual:*
(*A*) *Physical.*—To impart such a love of nature as will impel to healthful out-of-door living.
(*B*) *Spiritual.*—
(1) *Moral.*—To inspire such a companionship with nature as will lead to high ideals and moral integrity.
(2) *Esthetic.*—To implant an appreciation of the beauty everywhere revealed.
(3) *Intellectual.*—(*a*) To know nature, that the commonplace environment may have significance.
(*b*) To learn to reason to correct conclusions on the basis of one's own observations.
(*c*) (Possibly to provide a fund of experience as the basis for later science work.)

Now, let us add content to this bare outline.

The Social Aim.—As a good illustration of this sort of nature study let us take school work on the house-fly. The enthusiast sees how deadly the house-fly is, causing, as he believes, the spread of tuberculosis, typhoid, and the scourge of children's summer complaints, that decimates the ranks of the new-born like some medieval pestilence. It would be a boon to humanity if it could be exterminated. Here right to hand in the schools are the thousands of children. Send the message through them to their homes of the dread nature of the fly. Teach them the filthy habits of the fly, its life history, the means of its extermination, and send them out, crusaders in this campaign of sanitation. Nature study has had its initial opportunity in many a community through some such practical problem.

It is largely because we live in close association that society demands that the individual be healthy, a demand reinforced by personal considerations of comfort and success. It is more important that the child adopt a few simple hygienic habits than that he be taught a multitude of physiological facts. Often the nature-study method of approach is very impressive. The child is more influenced by conclusions he reaches on a basis of his own observations than by much he reads or is told. Let him see the numerous colonies of bacteria growing on a prepared gelatine plate to which he has touched his unwashed hands, and compare with the few colonies that grow on another plate as the result of contact with his freshly washed fingers, and he will be much more likely to be cleanly than from any amount of verbal instruction. Much of the hygiene instruction may similarly be given by the nature-study method, and so comes to relate directly to oneself, whereas book instruction often seems quite dissociated from personal application.

The Moral and Esthetic Aims.—Nature has been a prolific source of inspiration to the idealist, the seer, the artist. All through the ages the great souls have gone apart into the wilderness to wrestle with life's great problems, instinctively assured of sympathetic guidance from Mother Nature. And "Nature, the dear old nurse," has soothed them, healed the wounds of an unkind world, and led the way to higher ideals and larger achievement. Liberty has been born of the hills and religion conceived in the solitary places. Boyhood days in the open, under the tutelage of the arching sky, the rocky hills, the rolling ocean, are essential in the training of real greatness of character. And what is true of individuals seems also true of nations. Self-reliant, sturdy character, abounding energy, idealism, these are the gift of the sun-flecked sky, the bounding river, the wide prospect.

Appreciation of art in later life is surely dependent on stocking the mind of childhood with those elemental sense-impressions that are the very alphabet of art. Next to man

himself nature has been the great theme of art. To sense its beauty one needs be a veritable child of nature.

The Intellectual Aims.—The bulk of American children obtain only a common-school education. Their outlook on life is in a measure determined by what the grades give them. The average child lives his life in his home country. That commonplace environment is bound to mean little to him unless his eyes are opened to its significance. But no environment is commonplace. Everywhere one may see the operation of those mighty forces that have been at work through countless ages to shape the contour of the earth. Hills are being sculptured. Valleys are in the making. Rocks are disintegrating and reforming. The rock strata are full of the vestiges of a wonderful past. The roadside flowers and the animals of the meadows are suggestive of problems of their origin and their mutual relationships. The child who is made aware of these wonderful mysteries, whose eyes are opened to the meaning of these commonplace things in his daily environment need never lack for mental stimulation. He may travel farther in his own back yard than most tourists do in a year's journey. This is an important end of nature study—to teach the significance of the every-day surroundings.

The Scientific Method of Thinking.—Finally, and most important, it is a function of nature study to drill the child in scientific thinking—to teach him to reason for himself and to reason to correct conclusions on the basis of his own observations. The term observe is used now, not in the sense of seeing, but means achieving impressions through any or all of the senses.

Accuracy of Observation.—The first step in this process is to establish some conscious ideals of the accuracy of observation. The average person senses an object in a very indefinite way. We need to register it in mind if its image is to be retained with careful regard to its details and their mutual relations. An attempt accurately to sketch a flower, for instance, helps one to become aware of the visual details

of it. Trying to imitate the song of a bird will show one how lacking in accuracy and detail is his register of hearing. One must hear it repeatedly, analyze its elements and their relationships before he can begin to reproduce it.

Sensory Impressions the Basis of Thinking.—It is worth while to bring to the child a wide range of sensory stimuli. Let him smell the varied odors of the fresh earth and the flowers, feel the countless sensations of the stony pathway, handle the numerous objects the inquisitive child will pick up, taste the growing herbs and fruits, hear attentively the bird song, the strident insect note, and all the voices of the out-of-doors.

These sensations registered in our childish brains are the raw materials we later transmute into imagery and ideas. For all of our thinking and the resulting mature judgments come to be built upon the foundation of our sensory impressions. Read your Shakespeare and stop to see how dependent you are on the stored-up sensory impressions for an appreciation of the meaning. If the words are anything more than senseless hieroglyphics it is because they are connected up with significant sensory memories.

Let us bear in mind that observation just for its own sake is absolutely useless. There must always be a question to be settled if contact with nature is to be worth while. Much so-called nature study misses the point entirely because it neglects this fundamental principle. The nature trip or class exercise is often merely aimless wandering in contact with materials that are in themselves uninteresting. "How can we set up instruments so as to telegraph to the seventh-grade room?" "How does the ice-cream freezer work?" "Where do dragon-flies come from?"—these and similar problems set the pupils to observing because they need the facts in their thinking. Just ambling about in the out-of-doors is about as profitable as studying literature out of the dictionary; we go to the latter to find out something and then it functions.

Inductive Thinking.—Nature study not only affords abundant material for thought, but it should be made to furnish drill in the scientific method of thinking which, briefly, is reasoning to correct conclusions on the basis of accurate observations. Most school subjects afford little opportunity, as usually taught, for such drill. The facts may be beyond our personal observation, as in history, or the reasoning processes are presented in type problems that are outside our experience and interest. How we do need in a democracy citizens who are trained to observe accurately for themselves and to reason to unbiassed conclusions on the basis of the facts! What a boon it would be if, in our elections, for instance, citizens could lay aside prejudice and personal animosities, and vote on the questions submitted in accord with their best judgments, formed from reasoning well on the facts they had taken the pains to learn! Nature study has one of the largest opportunities in education. If the average child can be so taught the value of the scientific method of thinking and so drilled in it that he will use it in the solution of the daily problems of later life, the school will have admirably served its day and generation.

Summary.—Briefly, then, nature study aims to teach children to observe for themselves and to think inductively, to acquire a scientific attitude of mind, to appreciate the significance of the commonplace environment, and be mindful of the beauty about them, to form lifelong companionships with inspiring nature. Nature study is really a method rather than subject matter.

Principles of Method.—The moment these aims of nature study are clearly apprehended certain principles of method in nature study are well-nigh self-evident.

Commonplace Material.—The wise teacher will use only commonplace materials, for we are to teach through observation, and only those materials, consequently, should be used that are so abundant and available that every child may have opportunity to handle and study them individu-

ally. One not infrequently still encounters so-called nature study wherein the teacher with the one rare specimen in hand stands at the front of the room and endeavors to conduct the exercise. Ideally, the children go out of doors to study the objects, or obtain them from their home environment. In the garden, the field, on the farm, beside the brook, or in the woods, with abundant material, the desired plant, animal, utensil, or process is seen under natural conditions. Such out-of-door work under a teacher who has contagious enthusiasm will do more than anything else to impart a love for nature and habituate the pupil to sympathetic appreciation of nature's unvarying laws.

Our homes and shops and streets are crowded with material that the inquisitive child wants to know how to make and use. Beg enough old telephone material from your local concern to set up an instrument, and see if you can make it work. Find out why baking-powder makes biscuit rise, not by reading about it in books, but by devising and trying out some experiments. Make and send up a tissue-paper balloon. Discover how the cream separator works, and devise a simple experiment to show the principle involved. Make a compass. How much crushing force does the nut-cracker exert? Make a kite that will fly; why does it go up? At what time of the year can you make a willow whistle? These are suggestive activities. Such need to be graded, systematized, and selected for a particular community, but those given will show the wealth of materials available.

The Field Trip.—The field work needs to be planned with care. The teacher should go over the territory to be traversed in advance. The objects to be studied must be located. This assures definiteness. The trip must not be so stereotyped, however, that interesting things discovered by the pupils may not be included on the spur of the moment. It need not be a long trip. A vacant lot or old pasture beside the schoolhouse may afford abundant material for several field class exercises. Seasonal changes alter the animal and

plant forms on the same area. A single trip may cursorily go over territory where pupils see many things hastily that later may be brought into the schoolroom for detailed study. It is well to devote a trip to some one group. The trees of the region about the school, the common farm products, if in a rural community, the common weeds, the other flowering plants, the birds, especially during the migration periods, birds' nests, the common insects, the injurious insects of the neighborhood, the pond animals—these are all good materials to specialize on during one or more trips. When the trip is over the children should be quizzed so they will feel that they are held responsible for definite things. Trees, for instance, may be numbered with paper tags on the way home, and the children can be required to write on paper provided for the occasion the names of the trees, numbered consecutively, that they have learned on the way out. Or the nature-study period the next day may be used for a written description accompanied by a sketch of the one or two birds' nests visited.

Information Not the Desired End.—To impart information is not the chief end of the study of nature material. Do not tell the pupils facts regarding the objects in hand. Ask questions which will impel them to see for themselves. The successful nature-study teacher needs to be as adept at cross-questioning as an expert lawyer. We are trying to train accuracy of observation and scientific methods of thinking, and it is at this point that the average teacher fails. She has in all other work practically adopted the principle that the child's mind is an empty receptacle which it is her task to fill; she has made instruction synonymous with cramming and imparts to the child what she knows. This has been her practice so long that it is difficult to refrain from the practice and adopt a new method of procedure in nature study. Every supervisor of nature study in handling practice teachers encounters this difficulty repeatedly. No matter what the particular topic to be taught, the beginner comes flying to the

A field trip of the University of Chicago elementary school

supervisor with the demand, "Where can I find *books* that will tell me about dandelions or cats or rocks," or whatever is to be used as subject matter. Unaccustomed to gain knowledge directly for herself, the beginner asks for that second-hand information found in books. From the time the pupil enters the first grade until he graduates, his nose is stuck between the covers of a book in his endeavor to absorb an education. I would not senselessly decry the use of books. One should know how to use them, but he should also know how to use his eyes and ears and fingers. Fortunately, a teacher may successfully teach nature study who has very little book knowledge of the subject. In fact, if she realizes her ignorance and will set herself to learn the characters of the objects about her school, their habits, seasonal changes, and significance, if she will lead her pupils in studying, sketching, making notes upon, and interpreting the commonplace objects and phenomena about her, she may be an eminently successful teacher. That is what the successful teacher must do, anyway, no matter how much she may know, if she is going to succeed in imparting the right attitude of mind, the scientific attitude, and the enthusiasm that leads to ennobling companionships with nature. Agassiz' motto was: "Study nature, not books."

Garden and Agricultural Material.—Much valuable information may be acquired while the pupil is being drilled in the scientific method of thinking. Indeed, it should be acquired. The teacher should select subject matter that has large social and industrial value in her community for the nature-study work. Pupils may, for instance, learn for themselves by direct observation the life history of the mosquito, they can watch the deposition of eggs, the habits of the larvæ and pupæ, and can think out for themselves methods of extermination which they can test by experiment. So in a malarial region the school could be the centre of a campaign of mosquito extermination that would have large community value, and the work could be so conducted as to

have also superior nature-study value. Correlate with this the history of the clean-up of Cuba and the Canal Zone, with brief biographies of those heroic men who valiantly gave their lives in working out this problem of sanitation, and there is added that element of moral instruction looking toward the development of high moral ideals that can best be imparted in some such indirect way.

So the garden offers unlimited nature-study material. But teaching a boy how to earn pocket-money by raising lettuce and radishes in his back yard is not nature study. It is valuable in teaching industry, self-reliance, and other virtues, and with proper methods it may afford good nature study, but it does not necessarily do so. Nor is it particularly valuable educationally to teach a farmer lad, by rule-of-thumb methods, how to grow more corn on his acre. It has its economic justification. The same project, or problem, may be given educational value if the boy is led to work out for himself by appropriate experiment the proper methods of procedure, and thinks out for himself by inductive methods the reasons that lie back of his seed selection, corn breeding, soil treatment, and cultivation. It merely needs emphasis here that practical projects of this sort may be carried on in the name of education with no very large returns educationally unless the method of instruction is carefully arranged so as to insure not merely manual labor and the application of modern methods, but also drill in the scientific method of thinking.

The Project.—The practical project, or problem, is eminently worth while in all nature-study work. Indeed, it is difficult to see how the pupil is to be taught to think—and that is our major aim—unless he has an interesting project to think about. In the lower grades, where training in accuracy of observation is the large aim, acquaintance with the animals, plants, and minerals of the region is project enough, especially if collections can be made of some of these things according to individual tastes. But in the upper grades

Fourth-grade garden activities. Elementary school, University of Chicago

Making a telegraph at the University of Chicago elementary school

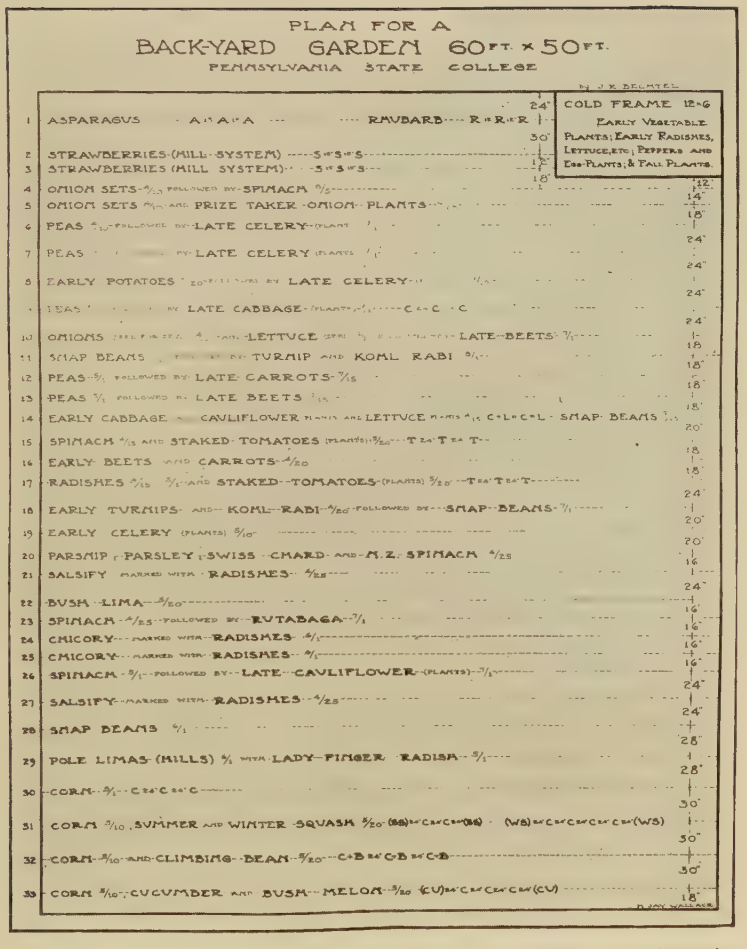
definite projects suited to the individual pupils are well worth while. The project may be connected with the farm or garden. A maximum crop of corn from an acre, a garden patch run as a commercial venture with accurate accounting of all expenses and receipts, a pen of chickens, a hive of bees, a corner of the orchard—these are suggestive of the kind of project that may be adopted by some or all of the pupils, to be worked to a successful conclusion through careful solution of difficulties, by patient observation, and by thinking out the various problems involved with the help of such information as books and pamphlets can give. In a Southern city one grade became enthusiastic in its study of a pen of chickens started by a setting of eggs and an old hen kept under the teacher's desk during the period of incubation. Their nature work centered around this pen for a couple of years. In a Western town it was an old orchard, abandoned by its owner, that served as the major interest for the nature work. The infested fruit, the scale, and other insect pests were collected, studied, and experimented upon in a small way, until enough information and confidence was acquired to undertake the task of pruning, burning the rubbish, spraying, etc., that brought the trees back into bearing.

Beauty and Moral Significance.—The appreciation of beauty and the moral significance that poet and philosopher have seen in nature are difficult to impart, impossible, in fact, directly. The teacher cannot gush over the beauty of a flower with the avowed purpose of inspiring her pupils with its grace. Pupils may be asked to sketch familiar things. One who has attempted to draw an elm and who has kept at it through repeated failures, learning from each to see more accurately, will better appreciate Corot's trees. Such reproductions of the masters (like Corot, Landseer, Bonheur, and others) as are readily obtained in the Brown pictures or the Perry prints may be hung about the schoolroom, so that children will come to know them, and so learn to see beauty in the commonplace as the artist has seen and expressed it.

It is worth while to correlate good nature literature with the direct study of the objects. A teacher could not give to seventh or eighth grade pupils the suggested significance of a butterfly's life history which they will take from Mrs. Sigourney's ode. Bryant's ode, "To a Waterfowl," Van Dyke's "Song Sparrow," and similar bits of nature poetry and prose are full of significant suggestion, well worth storing in mind against the day of moral stress and sore despair.

Nature Literature.—Much caution needs to be exercised in the choice of such reading-matter. It is well to place before the children only such as comes under the name of some literary personage of acknowledged reputation. There is a flood of books with alluring nature titles that are neither accurate in the information they purport to give nor of literary value. Above all, the teacher must recognize that time spent in reading "nature readers" is not time devoted to nature study. It is an easy way to fill the nature-study period to devote it to reading about nature, but that is a reading lesson, and neither teacher nor pupils should be duped into believing that such an exercise has value as nature study.

The Course of Study.—Finally, brief consideration may be given to the course of study in nature study. Few graded courses in nature study are yet available. The teacher is either left to her own devices to fill the nature-study period as she feels inclined, or an outline is provided that suggests many topics for each grade from which she is free to select. The result is what might be anticipated—haphazard work that soon falls into disrepute, or an attempt at organization by some teacher with a genius for the work. To assist in such organization these suggestions are offered: The work needs to have dependent continuity to have any large value in education. A series of disconnected lessons on various topics selected at the whim of the teacher has little or no value. Yet often it is the chance encounter of the teacher or some pupil on the way to school with a bit of stone, a strange flower, a fledgling from its nest, that directs the na-



Now is the time to encourage gardening on all vacant lots and back yards

ture lesson for the day. Each lesson needs to be built upon the foundation of preceding lessons, and children must get in the habit of holding in mind what is learned day by day for later use. Only as this is done and the days' increments are built into a connected whole can we expect to teach pupils to think, for thinking must be cumulative and constructive.

This is the chief value of "the project," that it unifies the work and is bound to make it continuous. More than that, the work needs to grow in complexity and difficulty as the mind of the pupil increases in capacity. It is no light task, then, for the teacher to lay out a satisfactory course for a year, and still more difficult to arrange the work for all the grades. It is a task that must be done for each community. The materials are different in various regions and the community interests will vary even in closely contiguous regions. Finally, whatever the subject-matter included in the course, it should be presented to the pupils, as far as possible, in problem form, as a task to be accomplished, not merely a problem to be thought out. It is the repeated solution of minor problems according to the scientific method of procedure—observation of the facts bearing on the problem, their classification and analysis, and the final formation of a judgment based upon them—it is this that constitutes the best thing nature study has to offer. And as the minor problems are so solved the pupil learns to depend upon the method. He should be made aware of what the scientific method of thinking is in the upper grades, so he may not only blindly follow it as a habit, but consciously put it into practice in his attack upon the questions he must successfully solve in life if he is to succeed even measurably.

SUMMARY

The Aims of nature study are many:

1. To habituate the child to healthful, stimulating companionship with nature.
2. To open his eyes to the truly wonderful significance of the homely environment.

3. To impart the scientific attitude of mind as a conscious part of his mental equipment. This means the child needs to be taught (*a*) to see the problems in the things about him; (*b*) to clearly define such; (*c*) to devise methods of attack in solving them; (*d*) to think out the solutions, and (*e*) try them out by experiment until (*f*) he reaches a sound judgment on the particular problem attacked.

METHODS:

4. All the nature work is therefore best given in the form of problems or projects.
5. These should be socially valuable when possible.
6. Always dealing with commonplace materials, and
7. Adapted to the local situation.

ORGANIZATION: The nature study

8. Should be definite.
9. Have dependent continuity, and
10. Increase in difficulty with the growing capacity of the child.

PROJECTS IN APPLICATION

1. What changes in the contour of your region is accomplished by the creek, river, or lake? Do not read books to find out what streams do, and then go out merely to verify this, but go out to find out at first hand.
2. Is the creek carrying sediment, and, if so, how much? Devise and try out experiments to find out.
3. Divide the school garden or vacant lot into individual gardens, and assign one, by lot, to each child. See who can raise the largest crop of string-beans, peas, or other early crop. As the class faces this situation, what problems do they see? Can they get the information they need?
4. As you look around, you see that houses are usually provided with chimneys. Can the children formulate a theory as to why this is so, and prove it for themselves, not consulting books, but simply using their own ingenuity?
5. Children each have in hand a piece of quartz and one of feldspar. Ask them to find out which is the harder.
6. Gather the fruits of a number of weeds, or look at the numerous fruits in the grocer's window. Do they suggest any problems? If so, could you devise some way to try to find the answers without consulting books? Can you prove your suggested answer to be either correct or wrong?

7. I have an aquarium with a few minnows in it and some water-plants; it has been covered quite air-tight for several months, yet plants and fish are healthy. Establish a similar aquarium and see if it suggests any problem. Can the pupils work out the answers?
8. Do your children know what color a dog's eyes are, and, if not, will they find out? Do the facts suggest any question? Can they answer it? You may need to let them use books for additional facts to try out their theories to account for the facts.
9. Is there any real difference between nature study and the new "general science" of the high school, and cannot the latter be organized in a sequence from the seventh year on in the six-six plan?

Note.—Teachers should read Dewey's "How We Think," especially chapters 6, 11, 14 and 15, for valuable suggestions on methods of cultivating the scientific attitude and habit of mind through skilfully guided school work.—ED.

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* = of special interest to teachers.

CHAPTER XVI

GEOGRAPHY

Preliminary Problems

1. Is it necessary for any one to know all the places on the map?
2. In what phases of world geography are little children most interested?
3. What methods of instruction most nearly take the place of actual travel to the child?
4. How would you define geography?
5. At what grade should home geography give way to more formal study of a text?
6. How large should a text-book in geography be? What other helps than the text are useful?
7. In how far are geographical facts dependent on each other?
8. Why does map sketching by the pupil fix position and form better than merely observing a printed map?
9. To what extent can the so-called spiral method of instruction be applied to geography?
10. How much knowledge of the rest of the universe is necessary in order to understand the earth?

I. New and Old Methods

Geography Teaching.—In her recent book, "The Promised Land," Mary Antin relates the marvellous effects wrought in her life by our American schools when she, a young Russian immigrant girl, came to this country. But of the instruction which she received in geography she makes an exception in the following words, which are very suggestive to geography teachers: "In the schoolroom, as far as the study of the map went, we began with the symbol and stuck to the symbol. No teacher of geography I ever had, except the master I referred to, took the pains to ascertain whether I had any sense of the facts for which the symbols stood. Outside the study of maps, geography consisted of statistics: Tables of

population, imports and exports, manufactures, and degrees of temperature; dimensions of rivers, mountains, and political states; with lists of minerals, plants, and plagues native to any given part of the globe. The only part of the whole subject that meant anything to me was the description of aspects of foreign lands, and the manners and customs of their peoples. The relation of physiography to human history—what might be called the moral of geography—was not taught at all, or was touched upon in an unimpressive manner."

Undoubtedly within the last fifteen or twenty years there has been vast improvement, not only in the methods of teaching geography, but in the selection of geographical material worthy to receive the time and effort of pupils. But yet there is room for improvement. The "sailor geography" and the illogical methods of the past generation have not wholly been carried away by the rising tide of a better pedagogy which has been produced by the work of such men as Parker, Geike, Redway, Davis, McMurry, Dodge, and others.

Modern Improvements in Method.—Perhaps the most marked changes which have occurred within recent years in geography teaching may be classed under three heads as follows: (1) The introduction of home geography; (2) the substitution of much descriptive matter in place of the memorizing of names which always remain names only; and (3) the constant recognition of cause and effect.

By means of home geography the child's mind is stored with concrete information with which he can afterward relate the new and otherwise unappreciated facts which he will learn of unknown places. With the aid of better textbooks and a wealth of supplementary reading available today, the dry bones of geography have been clothed with flesh and blood. With the emphasis shifted from facts to the *causal relation between facts*, an exercise which once was a draft upon the memory alone, has now become a cultural force which trains the mind to habits of reasoning which

will be of lifelong value. Much of what follows in this chapter must group itself about one or other of the above three phases of geography teaching.

II. Home Geography

Like its twin subject, nature study, home geography is a somewhat ill-defined branch in the school curriculum. Like nature study, also, it is difficult to teach. This arises from the fact that it is not a text-book subject, and, furthermore, that the local environment of each particular school makes uniformity impossible, so that each teacher must in a measure pioneer his way through the subject.

However, there are general principles which will help us not only to define the limits of home geography, but to present it to children in a logical manner. Scatter-brained effort here is of little avail. There should be running through the entire subject some thread of definite purpose.

Meaning of the Term.—Perhaps the most important guiding thought is that everything given under this name should be truly geographical. But here we are met with some uncertainty as to just what constitutes geography. Some say that it is "A study of the earth as the home of man." Others, putting the emphasis upon the human element, define it as "A study of man in his home, the earth."

A definition given by Mill will serve as a good basis for the selection and rejection of material both in home geography and in more advanced phases of the subject. He says: "Geography is the study of the earth in its relation to man and life."

Many topics relating to man or to the earth would not, according to this definition, be geography. For example, a detailed study of the government of Germany is an interesting study of man, but there is little relation between government and earth. Again, a study of geology is entertaining, but, excepting that phase of the subject which we call physi-

ography, geology has little relationship to life upon the earth now and to man.

Not every phase of life which the child sees about him can be regarded as geography, even in miniature or in embryo, and only that which will help to illuminate the pages of later geographical study should be admitted within the pale of "Home Geography."

Topics in Home Geography.—As in all geography, so here there are two classes of topics into which the subject matter may be grouped, the *social topics* and the *physical topics*—those in which life relations are the prominent features, and those in which earth knowledge is emphasized. Of course, as pointed out above, life topics to be geographical must be influenced by their relation to the earth, and earth topics must be shown to have an effect upon the life of man.

The *home* is one of the simplest of social topics, which should be studied because it furnishes concrete illustration of many of the phases of geography. Each member of the home has duties to perform, "occupations," and the purchase of food and clothing and other necessities of the family illustrates the commerce of the world. Perhaps a garden in the back yard furnishes some of the "products" upon which the family live or which they part with in exchange for things they cannot themselves produce.

In all such study the teacher must keep clearly in mind what is in its nature geographical and what is not.

The town, city or country community in which the family reside forms a second social topic which is productive of very much illustrative material. The social and commercial dependence of one family upon another; the organization among themselves for purpose of government or better social service; the need of easy communication, one family with another and with surrounding towns; the food materials which are brought into the community and the sources from which such supplies come, and why such things cannot as well be produced at home; what this community supplies to the outside world.

Such topics are purely geographical in their nature, and being within the range of the children's experience are suitable to prepare for them the way to a study of the geography of commerce and trade of the world.

In all of this study the concrete and personal element should enter as much as possible. Otherwise the study of one's own city might be as incomprehensible to children as a study of things farther removed by distance but perhaps nearer to the child's experiences. For instance, in studying the government and business life of the city the *men* who occupy official positions and who do the work of the city should be made the objects of study rather than the positions themselves. Some children may know a policeman or a fireman or a member of the council and be able to tell what his duties are, thus bringing the class into more intimate contact with the subject of the lesson.

Physical topics call for outdoor work. A river system made with a hoe and a garden hose is more true to nature than an indoor sand map of the same thing. Better still is a study of the river itself or even its counterpart, a streamlet with its branches, or a ravine and the smaller hollows tributary to it.

In the physical field, it is impossible to prescribe a home geography course suitable for all, for there is no such course possible. Those features should be studied which are present in the local landscape. The weather leading, as it does, to climate, is a universal topic, but the prominence given to various surface features and to streams or bodies of still water, will have to depend upon the proximity to the school of such features.

III. World Geography

Connecting the Known with the Unknown.—Growing out of home geography or, rather, as a part of it, should come to the child a comprehension of the world as a whole. This large conception may grow out of the child's study of familiar

things of the home and the community. The coffee we drink and the rubber of our automobile tires may be traced back to their source in South America. The wool in our clothing may have come from Australia and the rice and silk from Japan or China.

Such things make connecting-links between the child's mind and the distant unknown—serve as stepping-stones from the known to the unknown. After a discussion of the coffee-plantations and rubber-forests of South America, the sheep-ranches of Australia, and the rice-fields and silk factories of Japan and China, should come descriptions of other features of these countries.

The child life of distant lands is excellent material for a beginning in world geography. Stories of the Eskimos, the Arabs, the Chinese, the negroes of Africa, the people of India, and the American Indians, may be told in such a way as to impress children with the spirit of these nations. The spirit, or atmosphere, of a geographical situation is worth more at this stage than any number of geographical *facts*.

The countries selected about which to tell stories should be those of the simpler, more childlike, crude forms of civilization, and the life of the children of these peoples should receive emphasis.

In all of this work the globe should be in constant use. Small globes can be purchased very cheaply, and it is very desirable that each child have one on his desk while world lessons are being given. Unless the scene of our story be laid in a definite region the stories lose their force as geography and become little more than fairy-tales. Globes are much better than flat maps for young pupils, for they establish in the children's minds correct relationships of the places referred to, and a conception of the earth's form.

Prominence of Descriptive Geography.—If we compare the best geography teaching of to-day with a typical lesson of two decades ago, perhaps the most noticeable difference observed will be in the relatively larger amount of descrip-

tive matter now given. The old text-books gave very meagrely the descriptions which in the newer books are the life of the subject. Long lists of map questions were printed for study, the questions having little sequence or connection of any kind, one with another. These questions required a thorough study of the map, the details of which must be memorized instead of being organized into a causal relationship. Map study formed the backbone of the course, and there was comparatively little else.

To-day our texts are replete with valuable information given in sufficient detail to render it interesting. The market is full (and so should the school library be) of books supplementary to the text, expanding what the limits of a single book are too narrow to do when dealing with so large a theme, every geographical phase of the regions studied.

Supplementary Readers.—Formerly, if the geography teacher, realizing the meagreness of the text-book, wished to supplement it with assignments to be read by the pupil, he had to resort to a book of travel or adventure, the former often being uninteresting to children and the latter unreliable as to fact. A new class of literature has arisen to provide suitable instruction in an interesting form, the geographical readers.

The style of the better class of such books is unique. While the composition is good, still there is no effort at literary ornamentation. Long descriptions in which authors delight, valuable chiefly for their beauty of diction, give way in these books to a more direct style, better suited to convey instruction.

The success of these series of books has led some publishers recently to so extend their series that each volume deals with a very small geographical unit, thus practically defeating the purpose of the reader, namely, to supplement the pupil's text-book in so direct a form that he will be able to read the fuller account of all the countries of which his book treats. If a volume be devoted to a country which his text

passes over with a paragraph or two he will manifestly be unable to do this. Balance as regards the relative importance of countries is better preserved in the child's mind if his supplementary reading-matter is sufficiently condensed so that it covers large regions of the earth, giving to each portion its due prominence.

Reports on Supplementary Reading.—One of the finest cultural exercises in geography teaching consists in having pupils read sections of the supplementary books which the rest of the class have not read, and make oral reports upon their reading. The fact that they are giving to the class something which is new and interesting to them adds zest to the exercise. The recitation of a text-book lesson which every one else knows as well as the reciter himself, and which he is reciting merely to prove that he knows it, lacks an element of value which the "report" to the class group supplies.

Current Literature.—Magazines and newspapers cannot be used in the same way that geographical readers can to amplify each lesson, for current news is not usually pertinent to the lesson being studied at the time. However, every advanced class in geography should devote a definite allotment of time each week to a consideration of current events. In this way the class will come to realize that geography is a dynamic, not a static subject. As in the preparation of reports mentioned above, so here the pupils acquire some facility in selecting and organizing important facts from the mass of material under consideration.

The Geographical Library.—There is no subject (excepting literature) which so imperatively demands a well-stocked library as does geography. If they are well chosen, sufficient books may be secured for a comparatively small sum. There are few schools so poor as to be justified in spending nothing on a library of supplementary geographical readers. At the close of this chapter a short list of good supplementary literature is recommended, the total cost amounting to a very modest sum. Preference should be given to books which are

written especially for school use, such as the various series of readers.

Sometimes town and city schools are so situated that they can make a special arrangement with the public library, so that the books there become practically a part of the school's equipment. County libraries are beginning to carry to the child of the rural school the same privileges which his city neighbor enjoys.

Cause and Effect in Geography Teaching.—Recent emphasis upon causal relations among facts has done very much to improve the teaching of geography. It has been to this subject what the introduction of the philosophy of history into the bare record of past events has been to the teaching of history.

The facts of geography should be gathered in clusters like grapes, not one by one. The circumstances which bind facts together are often more important than the facts themselves, and if the connecting thread be preserved, the memory is greatly assisted in retaining what has been learned. An illustration will make clearer the difference between the teaching of isolated facts and a discussion of trains of causally related facts. The first of the two lists of questions below represents those found in earlier text-books, and has little to recommend it except that it is easy to make. The second list, covering much the same ground, is in line with more modern views of what geography teaching should consist of. It calls for thought, for solving definite problems, for comparison, for imagination, for reasoning from cause to effect—or from effect back to cause. The first list demands an exercise of memory only.

1. What is the latitude of Alaska? Name and locate the towns. Locate the Klondike region. Describe the Yukon River. What islands to the southwest? What strait separates Alaska from Russia?

2. What other regions lie between the same parallels of latitude which bound Alaska? Compare their climate with

that of Alaska. Why are the towns of Alaska near the coast? Tell some advantage each town has on account of its particular situation. Would it be nearer to go by water or overland to the Klondike region? Which route would be easier? What time of year would the river trip have to be made? Find by the use of the scale of miles how far it is across the Behring Strait. What nation might enter America across this strait?

Visualization.—Good teaching in geography keeps the child's imaginative faculty constantly on the alert. Mental pictures are continually forming, and the nearer these pictures can approach to the clearness of the traveller's actual perception the better.

There are several aids to the formation of good mental pictures which the teacher should definitely make use of. First, a vivid word-picture, perhaps read to the class, but better given in the words of the teacher, while requiring some time and preparation, is worth all it costs. Teachers should cultivate a style which will approach the vividness of an eye-witness's story. Second, what the child has seen and experienced, fortified by his course in home geography, helps him to picture unseen conditions. The imagination is helpless without some basis of experience. Even *it* cannot make bricks without straw. Third, the use of pictures in regional geography, and models and diagrams in astronomical geography are perhaps our best allies in securing adequate visualization. The modern stereograph probably comes nearer than anything else to arousing the same thoughts and feelings which would be evoked in the traveller as he actually looks upon the scene. Fourth, maps serve as a stepping-stone to enable the mind to reach a position where it can comprehend relative position and size. A mental image of the maps is first formed and then this is used to help us perform the otherwise impossible task of picturing the continent or the world.

Map-Drawing.—Map-drawing as an aid to correct visualization can scarcely be overestimated, and yet many teach-

ers waste much time of their pupils in this exercise. The trouble lies in the use of the wrong kind of map-drawing. If we make the map an elaborate picture, a work of art, it is of doubtful value, considering the time spent. But if we make it a quick (but not careless) sketch of only those features which we wish to be remembered, its almost daily use will be time well spent. Drawing at the board a rapid sketch map from memory forces the pupil when preparing for the test to fix his attention on the general form and relative position, to the neglect of details. This is exactly what we want. Daily exercises of this kind take but a few moments' time and accomplish wonders. Let the regions drawn be small, a single state, for example, and the exercise one of naming the surrounding regions and locating certain cities or rivers. Make the task definite, give a little time to prepare, have it executed rapidly, and finally dismiss it with a word of helpful criticism. A recent author says: "Twenty maps drawn in twenty minutes are worth more than one drawn in twenty minutes."

If a more elaborate map is desired occasionally it should be colored, as coloring takes but little additional time and adds to the pupil's interest in his work. The simplest color to use is a solution of diamond dyes (a package in about half a gallon of cold water) applied with a brush or wisp of cotton wrapped on a match or toothpick.

The chief value of such a map is rather to stimulate interest than to teach.

Another form of map which may profitably be drawn by the teacher and left permanently upon the blackboard is the chalk and charcoal map, a specimen of which is shown in figure facing following page. A raised map is scarcely better in showing contour, and it has the advantage of the sand map in that it can be more easily seen by all of the class at once. A lump or stick of charcoal and a piece of white chalk is all that is required in drawing it. First, the whole space is chalked in white. Then the mountains are drawn, using

charcoal on the shady side. The rivers and lakes, etc., are also put in black. Too much regularity in lining should be avoided, and the mountains and plains should be made to blend by rubbing with the finger.

IV. Physical and Commercial Geography

There is a very wide-spread demand for more physical and commercial geography than is incidentally included in the grade work in general geography. To meet this demand formal courses in these subjects are sometimes introduced into the eighth grade. Attention is entirely diverted from regional geography—to be fixed in turn upon the two sciences, commerce and physiography.

Fallacy in Such a Course.—Two considerations may be urged against this policy. First, the pupils cannot well afford to drop regional geography; and, second, at this age children are not mature enough to study these subjects as sciences. They are not ready for the generalizations necessary when commerce and physiography are studied apart from the regions which exemplify them.

A Better Policy.—A method which is at once practicable and sufficient to meet the demand consists in reviewing in the last school year the geography of the world, with emphasis upon two phases only of each country, namely, its physiography and industrial relations.

In this way a needed review is secured, but from such a different point of view that the work will seem new to the pupils; it will be a true exemplification of the oft-abused "spiral method." Three books of reference are needed for this work, the pupils' text, an elementary book on commercial geography, and another on physical geography.

One by one the units which make up physical geography will be brought out. When the lesson is upon Norway, the character and origin of the fiords will naturally constitute the main topic. Likewise, a study of Italy will consist prin-

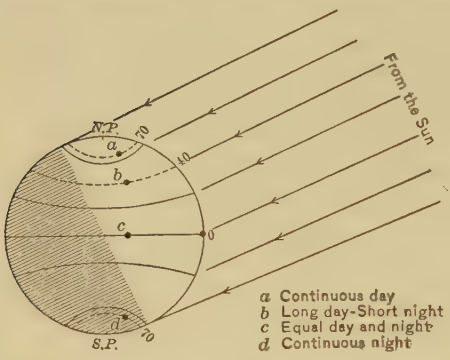
Chalk and charcoal blackboard map. A good substitute for a relief map

cipally of a discussion of vulcanism, etc. In countries like Germany and Great Britain the stress will be laid upon industry and commerce.

Astronomical Geography.—A phase of geography which is probably more neglected than any other part of the subject is that which deals with the earth as a globe and its relations to the rest of the universe. The cause of day and night; the two factors which together produce the seasons; the reason for the limits of the zones; the cause of the midnight sun; all these interesting topics can be made plain to children—but they seldom are.

Illustrative Helps.—The first thought to get clearly into the child's mind is a conception of the solar system. One of the most helpful models to demonstrate this relationship of earth, sun, moon, and planets is a simple home-made device seen in the accompanying figure. It consists of several balls of various sizes suspended from the ceiling, a larger (croquet) ball, *S*, representing the sun and smaller balls for the earth, *E*, the moon, *M*, and a planet, *P*, as shown in the cut. A string, *cd*, at the ceiling will allow the whole system to be revolved about the centre, *S*. The moon, being on a short string, makes several revolutions (months) about the earth, while both together pass around *S*, the sun, making a year. With very little trouble or expense such a model could be given a permanent place in any schoolroom.

To illustrate the cause of seasons a croquet-ball painted white, so that light and shadow will be more evident, may be carried about a lamp in a partially darkened room. A nail in each side represents poles. The axis from pole to pole must slant and always point in the same direction. Show what would happen if it did not always point in the same direction (toward the north star) or if it were vertical with respect to its orbit, or if it did not revolve about the sun.



For a means of demonstrating all phenomena connected with day and night and the zones, nothing can excel the globe used according to the following plan. We must imagine that the globe is really the earth and that we are located somewhere out in space looking down upon it. The globe must stand where the sun will shine upon it and we shall be able to see the regions of both day and night, light and shadow, as it is turned.

Set the globe so that the light covers it from pole to pole. It is now falling perpendicularly upon the equator, as may be shown by standing a pencil or other object on the equator vertically, with respect to the globe. It casts no shadow. This is the condition September 23 and March 21.

Now place two chalk spots upon the globe in different latitudes, but upon the same meridian. They represent two persons. Turn the globe and they will be seen to enter the shadow simultaneously and emerge simultaneously. This shows that with the sun over the equator the days are of equal length in all latitudes. The nights also are of equal length.

Moreover, it will be seen that the path traversed by each of these points crosses twelve hour-circles in the light portion and the same in the dark. The days are equal to the nights. This is the season of the equinox.

To show why winter days are short in northern latitudes, tilt the globe so that the sunshine falls 23½ degrees short of the north pole. Show as before that the sun is now vertical at the tropic of Capricorn. This represents December 21. Leave the chalk spots placed as they were before. Now turn the globe, and the more northern one is seen to enter the shadow sooner than the one farther south. Sunset in that latitude comes earlier, the day is shorter. To determine by how much the day is shorter, count the hour-spaces as before.

By similar demonstration the northern summer days can be shown to be long. The globe should now stand so that the sun shines 23½ degrees past the north pole. See accompanying figure.

To show the reason for continuous day or night at certain seasons in the Arctic Circle: Place a chalk spot near the pole. On rotation of the globe, while in the summer position, the spot does not enter the shadow at all. During rotation of the globe, while in the winter position, the spot remains constantly in the shadow.

The length of any day in the year in the observer's latitude (or elsewhere) may easily be found as follows:

By reference to the analemma, printed on most globes, ascertain the distance of the sun north or south of the equator upon that day. (Or this information may be determined by the pupils, using a "sun-board.") Having obtained the position of the sun, set the globe so that the sun's rays shall fall vertically in that latitude and then proceed as above to find the length of day and night in the observer's latitude.

The apparent motion of the sun north and south during the course of a year should be observed by the pupils. The younger children may record the changing length of the shadow of the house or some other fixed object at noon. The

older ones can make and use a "sun-board. A nail driven at one corner of a square board casts a shadow at noon across an arc of a circle, thus showing the position of the sun relative to the observer's zenith any day in the year.

V. A Suggested Course in Geography

Below the fourth grade there should be no book in the pupils' hands. Home geography, stories of interesting people, and instruction in the use of maps and globes should comprise the work. The children should learn how to draw a map and interpret it. Begin with maps of room and yard.

Fourth Grade may use an elementary book. Study the large and interesting facts about all regions of the world. In spirit the method should still be that of the younger grades. Descriptive story-telling should form an important part of the work. Strive for "atmosphere" rather than for formal facts.

Fifth Grade.—The southern hemisphere, South America, Africa, and Australia, is well adapted to appeal to the interests of this grade. Also, being finished here, it leaves the upper grades free to devote time to more important regions.

Sixth Grade.—A thorough study of Europe and Asia.

Seventh Grade.—The United States in detail, special attention being given to the home state.

Eighth Grade.—A study of the commercial and physical geography of all foreign countries, paying special attention to their commercial relations to the United States.

SUMMARY

1. Modern improvements in geography teaching have taken place along three main lines: (1) The introduction of home geography, (2) emphasis upon descriptive geography at the expense of so much "sailor geography," (3) recognition of cause and effect.
2. A course in geography should exclude all topics which do not have to do with *both* man and earth.
3. Home geography topics are: (1) Social (based upon the home and the community), and (2) physical (dealing with natural features of land and water, weather, etc.).

4. Home geography should merge gradually into world geography. In teaching world geography, *atmosphere* should precede *facts*.
5. In addition to a text-book every school should make use of (1) the supplementary reader in geography, (2) books of travel, (3) current literature.
6. A jumble of unrelated geographical questions may be compared to a disjointed skeleton. A causal relationship among the questions articulates the skeleton, and some interesting descriptive matter relating to the places mentioned covers the dry bones with flesh and blood.
7. Visualization is secured (1) by good verbal description, (2) by reference to things the child has seen, (3) by means of pictures, diagrams, and models, and (4) by maps.
8. Daily work in rapid map-sketching is of more value than elaborate, artistic productions.
9. Physiography and commerce should not be divorced from regional geography.
10. Astronomical geography deserves more attention than it usually receives, when placed, as it often is, as a brief introduction to the text-book.

PROJECTS IN APPLICATION

1. Compare a modern geography text-book with one of the past generation.
2. List the sciences which contribute to geography. To what extent is it allowable to draw upon each of them?
3. Point out all the activities of the home which have their counterpart in world geography.
4. Compare some book of travel with a supplementary geography reader with reference to available material.
5. See if all the facts to be taught about any particular country can be causally connected.
6. Of what advantage is the *National Geographic Magazine* (Washington, D. C.) to a teacher of geography?
7. What are the main contributions to your thought on geography which you are able to obtain from Dewey's "Democracy and Education" (Macmillan), chapter 16?
8. What materials may be obtained from the U. S. Government at Washington, D. C., of great service in geography teaching?

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CHAPTER XVII

AGRICULTURE

Preliminary Problems

1. (*a*) What is your chief aim in teaching?
   (*b*) Will it help you to accomplish your aim to include agriculture in the curriculum?
2. Why is agriculture the most fundamental of all the industries?
3. What branches of agriculture are of greatest importance in the community?
4. Is the average farmer in the community living up to his opportunities? If not, why?
5. Would there be a very marked difference in the community if the poorest farmer were to bring his standards up to those of the best farmer? Is it possible for him to do so?
6. Is it possible to make the home life a vital part of the school instruction?

I. Introductory

In order to understand the proper methods of teaching agriculture in the public school it is necessary to have a clear conception of the objects sought and the results which may be reasonably expected to be obtained by the teaching of the subject, as well as the possibilities and limitations which it presents.

Agriculture Defined for School Use.—In general usage, the term "agriculture" includes all forms of general farming, horticulture, forestry, and animal husbandry. As applied to the public schools, it indicates a study of the elementary principles of the science of agriculture and a training in the art of agriculture. In the lower grades it takes the form of school-gardening and that portion of nature study which deals with soils, insects, birds, and weather in their relation to plant growth and development. The chief aim of agricul-

tural instruction in the lower elementary grades is neither scientific nor commercial; it is designed rather to interest boys and girls in the general field of agriculture, to develop a love for plants and animals, to enable the children to see and to appreciate the beauties of nature—in other words, to foster a healthful attitude toward country life. In the upper grades and in the high school it becomes, to a limited degree, both commercial and scientific, but in all cases it must be primarily educational to remain a permanent part of the public school curriculum.

For convenience in discussion the work in agriculture in the elementary school will be considered in three groups, viz.: The primary grades, including grades one, two, and three; the intermediate grades, including grades four, five, and six; and the grammar grades, including the seventh and eighth grades (also grade nine, when it is a part of the elementary school system).

II. The Primary Group

Object Sought.—Since the agriculture suitable for pupils of the primary grades must necessarily be treated largely from the standpoint of nature study, little need be said in this chapter concerning this group. The chief object here is the cultivation of a love for living, growing things; and it matters little what is studied so long as it is something that appeals to the child, and the more senses through which the appeal is made the richer will be the experience acquired. For example, the smooth, shiny, red pop-corn, if followed to its predestined end, will appeal through five senses.

Selection of Vegetables and Flowers.—In selecting the vegetables and flowers to grow in the primary gardens some with large seeds should be chosen for the children to plant and some with small seeds should be planted by the teacher or older pupils for children to enjoy—some for beauty of color, some for fragrance, and some to touch the appetite.

Of course the seeds should be properly planted and well

"Everybody out" at the country school. May such days increase

Corn Club work of the Pennsylvania State College

Learning to judge cattle in club work

tended, and some of the pupils will observe the methods used. Whatever the pupils can do they should be taught to do to the best of their ability, but the teacher should remember that methods of planting and cultivation are incidental to the pupils in these grades and should not be emphasized. Children love to dig in the soil, to rake and to hoe, and with a little assistance they can lay out comparatively straight rows and drop the seeds with surprising accuracy, even in the kindergarten, but their minds are on the plant that is to grow and develop into a vegetable or a flower and should be allowed to remain there. The teacher must be responsible for the mechanical work, as well as the scientific planning.

III. The Intermediate Group

In the fourth, fifth, and sixth grades the pupils should become familiar with and be taught the uses of the various agricultural crops, where they grow, how they are transported, manufactured, and finally carried to the consumer. Much of this instruction should come through the reading of supplementary readers and state and Federal bulletins. Some instruction may be given as to the best methods of growing certain crops which the boys and girls choose to grow.

Boys' and Girls' Clubs.—Pupils of this age should be encouraged to join one of the boys' and girls' agricultural clubs, and careful supervision should be given to their work throughout the summer. In the village and city schools the school garden will play an important part; but even here, as well as in the rural schools, the most important phase of the work in agriculture is that done in connection with the boys' and girls' clubs. Work of this nature has been successfully carried on in various parts of the United States during the last decade and now practically every state has a state leader in charge of boys' and girls' clubs, who is located at the agricultural college, co-operating with the United States Department of Agriculture at Washington. The following excerpts

from government publications show the purpose scope, and value of this work:

The future of American agriculture is largely dependent upon the boys and girls of to-day in our villages and rural communities, and it is essential that we should interest, instruct, and direct them in the possibilities of farming as a profitable and dignified profession.

The boys' and girls' club movement is a definite effort by the United States Department of Agriculture, the state agricultural colleges and other institutions to promote and encourage the increased production of farm crops at a reasonable cost on small areas and to offer a plan of vocational guidance by requiring the club members to master a complete crop operation.

As a co-operative effort between the states and the United States Department of Agriculture this work began in Mississippi about nine years ago. Since that time there has been an increasing spirit of co-operation and a growing interest in better agriculture throughout the country, until now practically all the states have joined in this co-operative movement.

Some Objects of the Club Work

1. To secure an increased production of farm crops by encouraging more intensive farming and the best methods of soil-building, selection of seed, seed-testing, preparation of seed-bed, cultivation, etc.

2. To encourage more economical use of products grown by the proper harvesting, storage, and feeding, and by canning the surplus of vegetables and fruits.

3. To develop an interest in country life on the part of the boys and girls on the farm.

4. To adapt the boy to his agricultural environment and to cultivate self-expression within that environment.

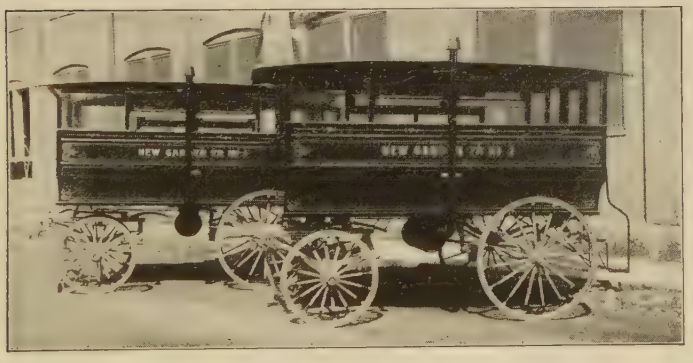
5. To teach the value of intellectual guidance, careful observation, and the need of a broader education for the farming population.

6. To connect the work of the school with the work of the home.

7. To furnish an easy approach, educationally, to all the interests of rural and village life. The club acre or plot should be the laboratory for the club members and the demonstration plot for the farmer. The club work becomes the connecting-link between parent and teacher, farm and school, and forms a co-operative atmosphere in which rural pupils may be developed to the highest ideals of rural life.

It is clearly the purpose of this organization to reach the boy and endeavor through instruction and direction in contests and friendly

Two trips, morning and evening, with over forty children. Bus heated by exhaust. Leesport, Berks County, Pa.



The Wayne school-wagon, heated by the Miller heater

Consolidation, good roads, the auto-bus, and a superior schooling

rivalry to encourage a training which is "four-square," viz.: the education of the head, heart, and hands, and the improvement of the health of the entire membership.

. . . . . .

The Organization

Local clubs should be organized with officers such as president, vice-president, secretary, treasurer, supervisor, and program committee. Arrangements should be made to hold one club meeting each month. A short and easily interpreted constitution and set of by-laws should be adopted. The program should be, first of all, in the interest of the particular club work. Debates may be held on the merits of different methods of cultivation, treatment for insects, diseases, etc., and as to the best kind of farm implements to be used. The secretary of the local club should send a report of the club meeting for each month to the state agent in charge of the club work.

A complete enrolment of club members and their standing should be kept by the local club and a copy sent to the state agent, who will transmit a copy to the Federal Department of Agriculture at Washington, D. C.

. . . . . .

Rules and Requirements

The age requirement for the boys' club work is from 10 to 18 years, inclusive, and the club member must agree to follow instructions, attend local and county meetings, make exhibits at the county fair or other institution convenient to the exhibitor, keep a record of expenses, income, observations, and work, and encourage others to enter the club work. At the close of the growing season he must also make out the regular crop report on the blank form furnished for this purpose by the Department of Agriculture, and transmit the same to the state agent in charge of the club work.

There is no way in which the agricultural interest of pupils of the intermediate grades can be awakened and sustained to better effort than through the club work. For this reason it should form a large part of the course in agriculture for these grades.

IV. The Grammar Grades, or First Two Years of the Junior High School

Content.—The work in these grades begins to assume an economical and a scientific development. The club work should be continued and extended. Simple scientific principles underlying successful methods of tillage may be taught and demonstrated in the laboratory and field. The economical importance of good, pure seed, the loss due to impurities, and the relation of seed vitality to high yields should be emphasized.

The Laboratory Method.—The laboratory method appeals to pupils of this age, and should be freely used. The pupils should be encouraged to test their own and their neighbors' seed-corn, to treat potatoes for scab, oats for smut, and to prepare spraying mixtures. Formulas and directions for this work can be secured from any state agricultural college or the United States Department of Agriculture.

General Laboratory Rules.—Always perform the exercise before assigning it to pupils.

Give simple, concise directions, avoiding technical terms with which they are not familiar.

Use sketches for illustration, not for the mere purpose of making sketches.

Require careful work and accurate systematic keeping of notes.

Reports on exercises should contain the following points:

Subject.
Number of exercise.
Subject of exercise.
Materials and apparatus used.
Manipulations.
Results or conclusions.
Name of person performing the exercise.
Date.

It may also at times be advisable to require written compositions in connection with the reports.

After the exercises are completed questions should always be asked to bring out the important facts which should have been learned in performing the exercise.

The application of these facts to present-day conditions should be discussed.

These rules are general, and each person must make his own interpretations to suit existing conditions. No outline of work can be made to fit exactly more than one set of conditions.

Suitable Exercises.—The following exercises are suggestive of some of the things that may be taught and the method of teaching.

Exercise No. I

Presence of air in soil.

Materials: Pail of water, lumps of earth.

Directions: Drop lumps of earth into water and watch air-bubbles rise, or immerse pot or can of soil in water and observe bubbles rise.

Exercise No. II

Per cent of air in soil.

Materials: Glass tumblers, graduate, soil samples.

Directions: Put 4 oz. (¼ pint) of soil into the glass, using a different soil in each glass. Put an equal amount of water in the graduate and pour carefully into the glass until the water rises to the surface of the soil. Find how much water has been used, and do the same for all the soils. Record the results as follows:

	Soil No. 1	Soil No. 2	Soil No. 3
Volume of soil	.....	.....	.....
Volume of water added	.....	.....	.....
Per cent of air-space	.....	.....	.....

The amount of water added is an approximate measure of the air-space.

Which soil contains the most air?

Exercise No. III

Testing of clover-seed (or any other seed).

Materials: Balances weighing to centigrams or milligrams, hand-lens and samples of seed (samples of seed should be obtained from the local seed stores).

Directions: Weigh out one gram of the seed. Separate it into

1. Pure seed.
2. Broken seed, dirt, etc.
3. Weed-seeds.

Weigh each portion. Make a germination test for the pure seed. Do each sample according to directions. Record results as follows:

	First sample	Second sample	Third sample
Weight of sample	1 gram	1 gram	.....
Weight of pure seed	.....	.....	.....
Weight of inert matter	.....	.....	.....
Weight of weed-seed	.....	.....	.....
Per cent of purity	.....	.....	.....
Per cent of germination	.....	.....	.....
Price per pound	.....	.....	.....
Cost per pound of pure seed	.....	.....	.....

Identify the weed-seed, if possible.

Which seed would be the best to buy? Why?

Note.—Where scales are not available, approximate results may be obtained by counting, say 1,000 seeds, and estimating the dirt, etc., and recording the number in each item instead of the weight.

Suggested Topics for Other Exercises

Testing seed-corn.
Movement of water by capillary attraction.
Percolation of water.
Treating potatoes with formalin solution.
Preparing Bordeaux mixture.
Effect of mulch on soil.
Effect of lime on soil.
Water capacity of soils.
Effect of drainage on germination.
Selection of seed-potatoes.
The home orchard.
Insects. Collecting material, observing metamorphosis, etc.
Apples for market.

Final exhibit of a corn campaign conducted in the Philippine Islands by the Bureau of Education, Manila, P. I.

Country roads—keeping in repair.
Seasonal practice in eradicating worms and other pests.
Feeding the dairy-cow.
Feeding beef-cattle.
Erosion and cover crops.
The potato-tuber: composition, cooking, food value.
The garden—hotbeds, seed-flats, etc.
Birds which assist the farmer.
Identification of apples.
Feeding of pigs.
Milk as food.
Care of the horse.
Artificial incubation.
Alfalfa.
Forest-fire prevention.
Effect of color on heat absorption.

Outlines for these and many other exercises may be found in bulletins published by the several agricultural colleges and state departments of education.

Rural and Urban Conditions.—Conditions obtaining in rural and urban communities are so very different that the same methods of teaching will not apply to both. Urban children are not acquainted with garden-vegetables and flowers, and their growth and development as well as the methods of planting and cultivation are at once both new and interesting, while rural children are familiar both with the plants themselves and the mechanical processes required in growing them. It is necessary, therefore, in the rural school to lay more stress upon the quality, use, and economic importance of the product. In fact, it may be well to push forward the work in the rural school, since the environment of the pupils furnishes much of the instruction which must be given in the urban school. It requires a greater knowledge of the subject and greater tact to teach agriculture successfully in the rural than in the urban school.

V. Correlation

In the following discussion of the correlation of the different subjects included in the common branches with agriculture, teachers should bear in mind that we are not dealing with the methods of teaching the different subjects, but with how agriculture may be taught through these subjects.

Reading.—For supplementary reading use nature and country-life poems and stories, newspaper and magazine articles, agricultural readers and government and state bulletins. These are all easily secured, and, while lending their aid in the teaching of agriculture, they will, if well chosen, furnish interesting subjects for reading and discussion, thus increasing the value of the reading lesson. This is true for all the grades, but particularly true of the intermediate and grammar grades where interest forms such an important factor in good reading.

Many poems of James Whitcomb Riley, L. H. Bailey, John G. Whittier, and the prose compositions of Nathaniel Hawthorne, Louisa M. Alcott, and others, will help to increase the love of country life, dignify agricultural pursuits, and enrich the literary possession of each child.

Writing.—So long as movement and form are the principal objects sought and only exercises are used, writing, as a subject, or exercise, offers little opportunity for teaching agriculture. When the pupils have reached the word-and-sentence stage, however, a careful selection of words and sentences with reference to important underlying principles of agriculture is feasible. The following examples may prove suggestive: Agriculture, dairying, animal husbandry, horticulture, pomology, entomology, etc.

"The first farmer was the first man."

"Plow deep while sluggards sleep."

"He that by the plow would thrive,
Himself must either hold or drive."

"God Almighty first planted a garden."

"Earth is here so kind, that just tickle her with a hoe and she laughs with a harvest."

"When tillage begins, other arts follow."

Longer dictation or copying exercises may well be selected from country-life literature.

Arithmetic.—No subject taught in the elementary school offers a richer field for correlation with agriculture than arithmetic, and this is equally true of all grades in the elementary school. The laying out of the school-garden or home plot requires measurement, as well as the spacing of rows and planting in the row, and all offer practice in judging distances with the eye. The measuring of crops grown also brings in different forms of denominate numbers, etc. But this is using agriculture in the teaching of arithmetic rather than the teaching of agriculture through arithmetic. The latter can be done just as easily by making the arithmetic apply to home conditions. Suppose we have each pupil rule a sheet of paper and put in headings similar to the following, but fitting it to the particular community by omitting those that are not pertinent and including others that are of importance.

Have each pupil take home with him his sheet of ruled paper with the proper headings and, with the help of parents, fill in the first line after his own or his father's name, similar to the example given. The next day have Johnny Jones read his data and all other pupils in the class fill in line one after Johnny Jones's name; next Willie Smith may read his data and the class may write; and so on, until all have the complete data concerning the farms of the community, *i. e.*, that portion of the community which is represented by the pupils.

	Name of owner.	Acres in farm	Acres cultivated	Acres in corn	Acres in oats	Acres in potatoes	Acres in clover	Acres in hay	Number of horses	Number of cows	Number of hogs	Number of sheep	Number of poultry	Number of apple-trees	Value of land per acre	Bushels of corn per acre	Bushels of oats per acre	Bushels of potatoes per acre	Tons of clover	Tons of hay	Barrels of apples	Value of horses per head	Value of cows per head	Value of hogs per head	Value of sheep per head	Value of poultry per head	Acres of tomatoes
1	L. Brown.....	160	130	40	40	10	40	.	10	12	60	.	100	100	$175	60	45	100	2	.	50	$150	$75	$15	.	$0.75	.
2	C. Hooker.....	150	140	40	40	.	40	20	6	10	20	10	50	.	180	50	40	.	1½	2	.	130	60	10	.	60	.
3	.....	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
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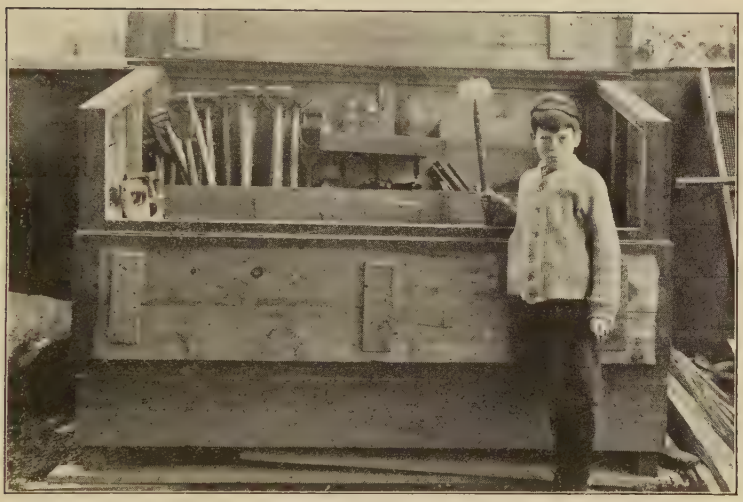

A tool-box made by the pupils at Montclair, N. J.

Locustdale Poultry Club of a one-room rural school in Berks County, Pa. The teacher is a graduate of Cornell Agricultural College

Also have pupils make an inventory of the farm machinery and equipment similar to the following:

FARM DATA TAKEN FROM AN AVERAGE LOCALITY IN MIDDLE WEST

1 walking breaking-plough	$15.00
1 sulky breaking-plough	45.00
1 spike-toothed harrow	15.00
1 disk-harrow	25.00
1 drag	5.00
1 steel roller	45.00
2 cultivators, at $25	50.00
1 weeder	15.00
1 self-binder	125.00
1 mower	45.00
1 tedder	25.00
1 hay-rake	25.00
1 grain wagon	75.00
1 farm wagon	40.00
3 sets work harness, at $30	90.00
1 set carriage harness	30.00
1 carriage	125.00
1 driving or road wagon	75.00
Miscellaneous, including hoes, axes, forks, etc., and carpenter set	40.00

Any of these items not found on the home farm should be omitted and others not found here should be included. The prices used should be the current local prices—not those given here.

Average distance from market	... miles
Number of loads hauled per day	.....
Average load: hay	.....
corn (on ear)	.....
corn (shelled)	.....
oats	.....
Cost of shelling corn per bushel	.....
Price of labor: Single hand	$..... per day
Man and team	" "

Average amount of food consumed per day:

ANIMAL	GRAIN	ROUGHAGE (HAY AND SILAGE)
Horse.....	..... lbs.	.....
Cow.....	.....	.....
Hog.....	.....	.....
Sheep.....	.....	.....
Chicken.....	.....	.....

With these two sheets of paper in the hands of the pupils the teacher is ready to ask questions and frame problems. If these questions are well chosen the pupil will have the best sort of training in arithmetic, and at the same time acquire a great deal of valuable agricultural information which may lead to better practice in farming.

Agricultural Arithmetic.—The following questions are suggested to show the possibilities in the use of this form of practical arithmetic in teaching agriculture and at the same time the variety and number of problems it affords:

1. What are the most productive crops of this community in order?
2. Which crop yielded the greatest per cent on the investment on your own farm? In the community?
3. If the grocer bought your tomato crop for (local price) per bushel and sold them at (———) per quart, what would be his gain?
4. For what price should you sell your potatoes in order to secure 5 per cent interest on the investment, allowing regular farm prices for your labor?
5. What was the labor income on your farm last year?
6. If good seed-corn would increase the yield 10 bushels per acre, how many bushels would you have gained last year by using good seed? Upon this basis how much could you afford to pay for good, tested seed-corn?
7. If depreciation in farm machinery amounts to 10 per cent, how much should you allow for machinery each year?
8. If you sell one-third of your oats at market price, how much will they bring? If you receive a note in payment and discount it at the bank at regular local discount, what amount would you receive?
9. At what expense can an old orchard of fifty trees be made to produce apples that will compete with the best in the market?

Spelling.—The use of names of seeds, plants, flowers, tools, etc., as they come into the experience of the pupil and will be used by farm folk in their business and personal letters, will help to familiarize them with agricultural terms and help them to spell words they will frequently use in writing.

Geography.—Transportation of farm products calls for the use of bodies of water, as well as the building of railroads. Cities may be studied as centres of export and domestic trade.

The study of population and races will account for certain types of farming, as will also the study of mountains, valleys, and bodies of water. The pupil may also learn much in the formation of soils by the actions of glaciers, running water, frost, etc.

The study of geography should develop interesting discussion upon soil questions, as: Why is cattle-raising most prominent in the southwestern part of the United States? Why is market-gardening in New York and Massachusetts more profitable than in Arizona and New Mexico? Why are Vermont and Wisconsin great dairy states? Why does Maine grow potatoes instead of corn? Why are few sheep raised in the South? Why do not other states besides California and Florida grow oranges?

History.—The history of any country should tell much of its agricultural accomplishments. The influence of important inventions and discoveries, the effect of war or pestilence, the change of political control, all these have a marked influence upon agriculture. This is shown clearly in the following examples: The invention of the cotton-gin and the harvester, the agricultural conditions existing in the Southern states after the Civil War, the changes in farming in the South due to the ravages of the cotton-boll weavil, the increase and decrease in wool-growing due to the changes in the tariff. These and many other facts in history will emphasize the importance of agriculture, create greater interest, and explain some problems.

Grammar and Language Work.—Pupils will not only become interested in agriculture by writing about their farm experiences, but they learn the use of language most rapidly when discussing things with which they are familiar. All forms of written work in grammar and language offer excellent opportunities for increasing the knowledge of agriculture, from the letter requesting the sending of a seed catalogue, the ordering of seed, the discussion on fertilization, cultivation, etc., to the completed story of "How I Grew My Crop."

Hygiene.—Hygiene in the elementary schools usually includes more or less study of sanitation and hygiene. No problem on the farm is more important, and no subject offers greater opportunity for making the school work practical. Rural sanitation and personal hygiene need to be emphasized in all rural schools and if properly taught will help to solve the social and moral as well as the economic problems of the country.

Why is typhoid more common in the country than in the city? Why is the average life of the farmer's wife shorter than that of the business man's wife? Why are epidemics more easily controlled in the city than in the country? Why is tuberculosis increasing? What do the state boards of health reports say about the principal causes of death and illness of country people, and how may these evils be prevented?

VI. Possibilities and Limitations

The amount and the value of agriculture that may be taught will be determined almost entirely by the qualifications of the teacher. Three things are necessary for the best results, viz.:

1. Real interest in the subject and faith in its possibilities.
2. Information on the subject matter to be taught.
3. Ability to interest and instruct the pupils.

A teacher cannot teach what he does not know, yet even more important than a knowledge of agriculture in the teach-

A brooder and laying house, Berks County, Pa.

Poultry club work of Pennsylvania State College

A home-made brooder

ing of that subject is a sympathetic attitude toward country life and its problems and an optimistic faith in its future. The teacher who thoroughly believes in the opportunities of the rural community and who desires to help mould its future may do much in his school to improve rural conditions, and by accepting opportunities can each year gain materially in his fund of agricultural information. Without this sympathetic attitude of mind and heart it were better to leave the teaching of agriculture to some one else. It is imperative that the teacher of agriculture realize his limitations.

SUMMARY

1. Agriculture is a fit subject for all grades, but the point of attack and the emphasis should depend upon the age and experience of the pupil.
2. Agriculture forms a rational basis for the proper correlation of all school subjects.
3. It offers direct means of connecting the home and the school.
4. Its laboratory and field exercises create interest and teach accurate observation.
5. It shows opportunities and establishes faith in rural life when taught by a sympathetic teacher who has the vision and who believes in it.

PROJECTS IN APPLICATION

1. Make a list of the bulletins from the U. S. Department of Agriculture and from the U. S. Bureau of Education that would be helpful in a school such as the one you are to teach in, either for pupils, teacher, or patrons.
2. What other similar literature is available?
3. What novels give high ideals of country life, similar to Herbert Quick's "The Brown Mouse"?
4. What is the best way to carry on and supervise club work in the summer?
5. Is there a grange in your community? If so, learn what it does and could be made to do under skilful leadership?
6. What are some of the leading movements for the improvement of country life?
7. Get up a harvest exhibit at your school and have judges and prizes for incentives.

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CHAPTER XVIII

HYGIENE

Preliminary Problems

1. What subjects were most emphasized when you studied hygiene?
2. What were the shortcomings of the course; what its strong points?
3. From what ailments and defects do your pupils and your community suffer most?
4. Are you familiar with the health statistics covering your community or your state?
5. How much teaching time has been lost in your schools per year on account of sickness of teachers?
6. Have you ever examined your pupils, with a view of detecting and correcting serious physical defects?
7. Are you identified with any of the health organizations in your community?
8. What health problems are at the front now in the attention of your health officers?
9. Do you make use of the large amount of current literature in matters of health furnished, usually free, by state departments of public health and other public organizations and societies?
10. Do you have books or magazines available that keep you in touch with the rapidly growing amount of knowledge in the field of diseases and their prevention?

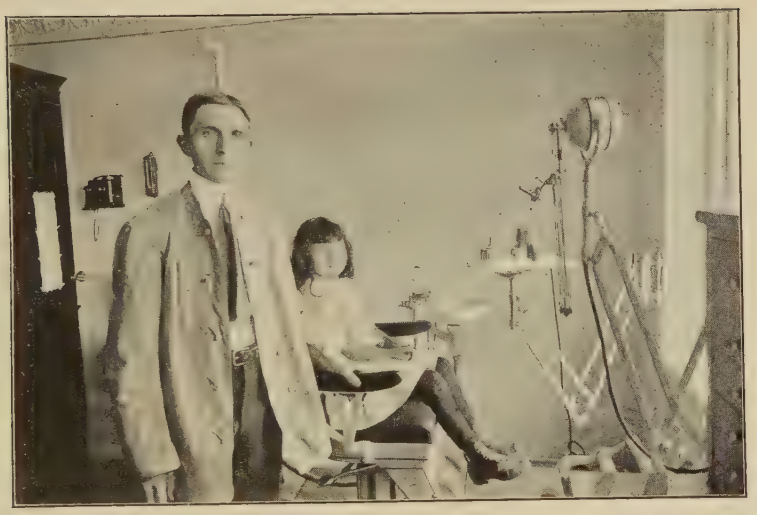
I. The Aims and Problems

The Subject.—In a strictly scientific sense, the field of physiology and hygiene is fairly well determined. In college and university courses, in spite of certain differences, the ground to be covered is a tolerably definite one. Advanced text-books for higher institutions or medical schools show a remarkable uniformity in the subject matter included. By this it is not meant that the science of hygiene is entirely separated from related fields of knowledge. Our divisions of knowledge into the several sciences, each with its own

name, is largely an arbitrary one, and is necessitated by the limitations of the human mind. The physiologist and hygienist, not unlike workers in other fields of investigation, must reach into related subjects at every turn, and the boundaries of their special fields are often lost on the general map of scientific truths.

But while the term hygiene, or physiology, has for the technical student of that subject a fairly definite connotation, the matter is entirely different with the same term when used to denote a subject of study, or a course in the curriculum of the average elementary and secondary schools. Here the term becomes so vague, is so wide in its application, that it is not far wrong to say there is not, to-day, among teachers in elementary and secondary schools any generally accepted consensus of opinion as to what this term should include. The organizing principle is not scientific classification, but life needs and learning abilities. Anatomy and morphology must be represented as needed, and if the teacher has had extended biological training, he will probably wish to supplement the bare anatomical details of human anatomy with brief and simple illustrations from the field of comparative animal morphology. Not infrequently the teacher who is familiar with microscopic technic emphasizes, as much as his time and equipment will permit him, the minute and histological structure of the tissues, and physiology is studied largely through the microscope.

More recently, with the growing emphasis on matters of health, the elemental facts of bacteriology have been included. The nutrient plate for growing bacterial colonies and the tube culture for demonstration are finding their way even into the courses of our elementary schools. Teachers having in mind the more practical results of instruction in health, not infrequently take most of their subject matter from the field of preventive medicine itself, and discuss with some detail the causes and the methods of prevention of the common diseases. Hygiene in the elementary and secondary



"Health is the first wealth" in Toronto. A school dental clinic

A clinic in Cincinnati. Vital efficiency is the first aim of education

schools has come under the influence of the newer functional emphasis in education, and already voices have been raised in protest against much of the older content of the subject. The part given to anatomy and physiology has been abridged; the histological portion has been almost wholly eliminated, the purely physiological discussion of function much reduced, and the entire emphasis placed on strictly utilitarian ends, the promotion of health and normal physical development. Instruction is demanded in all matters of practical sanitation, and problems of health and disease are to be discussed to make for better physical efficiency. As the direct returns are not so evident with much of the purely physiological subject matter, such as circulation, excretion, etc., these topics are all to be greatly abridged.

New Significance.—The topics of digestion and nutrition are also to be treated with a new significance. One of the fundamental economic problems is that of food; and hunger is held by the modern school to be one of the few elemental social forces determining society. It is pointed out that to be well nourished is the larger part of being physically sound. To it much of disease is the result of improper distribution of food, resulting in want, or perhaps in waste, and brought about not only by poverty, but more frequently by ignorance of dietary matters. It is, therefore, demanded that the schools shall deal thoroughly with the composition of foods, their physiological value, their proper preparation, and their digestion and nutrition, in order that such foods may yield their maximum nourishment to the body, and that the expensive food-supply be intelligently conserved. Already "nutritional physiologies" are appearing in increased numbers in the book market.

Finally, there are those especially interested in sociological problems who desire that the teacher of hygiene shall not fail to show that the newer education and the newer sociology rest in no small part on biological foundations. Physical development and heredity figure largely, at present, in all

discussions of human behavior. The treatment of the delinquent and the criminal has greatly changed with the growing notion that flesh and blood have something to do with their acts. In education the normal and the subnormal are no longer so generally forced through the same moulds. Pedagogy, psychology, and sociology are more and more realizing the importance of the physiological antecedents that determine human character. It is becoming clearer that many reactions supposed at one time to be purely "mental" or "normal" are in reality conditioned by physiological states entirely chemical or physical in their nature. Mental defects, criminality, and delinquency of all forms are, therefore, being studied more and more as forms of disease, and the correcting of such defects is not infrequently accomplished through hygienic methods. In fact, it is only very recently that science has really undertaken to study in a fundamental way the nature of human behavior. Surely some of the simpler but still far-reaching conclusions in this field will find an appropriate place in the teaching of hygiene, even in the elementary upper grades.

II. The Teaching of Hygiene

Teaching vs. Hearing Lessons in Hygiene.—Whatever their shortcomings, the claims for hygiene as stated above have at least this in their favor: they are positive programs advanced by teachers and writers having a dynamic interest in the subject. Unfortunately, there remains a class of teachers who have no objective point to reach in their instruction in the subject. They follow the prescribed outline or adopted text-book with servile conformity. The recitation, although apparently in common English, is nevertheless educationally in a foreign jargon of scientific terms and alien ideas. Sanitation is discussed in an insanitary school building, without discovery of the inconsistency; and the bookish discussion of fresh air goes on in an ill-ventilated classroom. The children suffer from many preventable ailments and

Philippine children are given the best of medical care. Vaccination day, Manila, P. I. Courtesy Bureau of Education

defects before the unseeing eyes of such teachers. The truths they present have no pragmatic consequences. They do not affect conduct in thought or action when the course is over. Such have preached no gospel, launched no campaign, and given no new visions of things that ought to be, in matters of physical well-being, either individual or for the race.

The many and divergent claims pressed upon the teacher of hygiene by experts in this field can obviously not all be well met. The program is too big. Neither the time allotted, the customary training of the teacher, nor the maturity of the pupils will permit such a varied emphasis. It is necessary that these matters be carefully sifted in order that we may know what is reasonable and proper in the way of health knowledge, habits, and ideals to put into the courses of elementary and secondary schools, assuming that the great majority of the pupils will get no formal instruction in this field after leaving these schools. In such a study, portions of the subject of physiology should not be excluded merely because they are old and have formed a part of the traditional content of instruction, nor should the multiplicity of the newer things in this and related sciences be included merely because they are new. Knowledge, habits, and ideals that are fundamental to health and normal physical development are the only minimal essentials which have a right to appear in the brief hurried course of the common schools. Other values, such as training in the scientific attitude and habit of mind, can also be developed, but will be kept contributory to the main purpose.

The New and the Old.—It has just been stated that it is not a matter of oldness or newness that determines the value of a fact. It is of importance only that the thing be true and worth while. And yet there is a quality to newer ideas that gives them greater carrying power. A field of study, now under active investigation, engaging the interests of many minds, has a vitality, other things being equal, that is not so easily imparted to older settled facts from which cur-

rent interest has more or less departed. The "firing-line" in any subject is the most inspiring part of that subject to teach, and, no doubt, to learn. The very fact that knowledge is not yet complete, that gaps still appear, that explanations are not yet always forthcoming, produce the very atmosphere of the healthy, inquiring mind. There is no formal rubbish, dried and cut into educational bundles, that can for a moment compare with the stirring questions now at the front. This is the sport of hunting live game. This is the interest in to-day's news rather than yesterday's paper. This is also the heart of the scientific attitude of mind.

The purpose of the instruction in hygiene is, no less than in other sciences, to awaken an intelligent interest in its problems, strong enough to carry their study beyond the period of formal instruction, and vital enough to command the will to translate this knowledge into appropriate actions. In few subjects is this freshness of knowledge so accessible as in this field. The great amount of research is bringing new facts to light almost daily, and the public interest in matters of health and disease soon makes these discoveries current information.

Problems of sanitation are being concretely worked out by many cities, and movements for safeguarding the public health may be studied at first hand in practically every community. A great amount of literature is now being sent out by various organizations to educate the public in matters of health. The health departments of the various states are becoming more and more aggressive in their campaigns for better things, and the teacher who will seize the opportunities of keeping in touch with these various agencies all at work in his line, can command an amount of dynamic educational energy that will save his course from slavish bookishness and empty results.

What to Teach.—Remembering that hygiene is not yet, and probably never will be, a conventionalized subject, with static, accepted, and traditional content, it becomes neces-

sary for the teacher to review the possibilities before him, to examine critically the claims of experts or the programs of enthusiasts in some cause, and then with the limitations of his situation clearly in mind, to formulate a plan of work, which for him shall seem most promising in its results. What to teach and how to teach in this field of hygiene will, therefore, remain a problem that each instructor must in part solve for himself. Too many factors enter into effective teaching to make it possible to anticipate all in any general plan. The teacher's own interests soon outweigh other matters, and facts and ideas that express convictions of the instructor will soon displace the merely academic opinions which are a part of his physiological baggage. In education, as in warfare, the telling impact of a missile depends not only upon the quality of the metal hurled, but also upon the carrying momentum imparted to it. There is, therefore, much danger in singling out a series of facts as *the* facts to teach. There is no surer way of taking the life of a subject than by strangling it in this manner. No small part of the delight of the teacher of science comes from his appreciation that nature is infinite at every point, that there are no boundaries to his subject save those imposed upon it by his own lack of knowledge, and that even with his limited vision he may look at facts from many angles and marshal them into innumerable new forms.

The sciences in the past have suffered from overstandardization. There have been too many ready-formed outlines which have tended to rob the teacher of his initiative and the subject of its freshness. A science is entirely too large to make any pupil in the elementary or secondary school appreciate its logical coherence. That is for the scholar in the subject. The health, recreational, and physical development needs of pupils and parents set the problems for organizing the work. Minimal essentials here are desirable.

The Problem and Service View-Point.—The undergraduate must approach the new subject with the attitude of the

explorer, the discoverer, and the solver of life's principal problems, such as health and the others mentioned in Chapter I. He will be helped most, not by learning the answers to formal questions imposed arbitrarily upon him, but by charting his unknown seas and continents and solving the problems himself from the facts before him. He may have little interest in the prescribed syllabus, but he is quite willing to be an incipient sanitary engineer. To make a sanitary survey of a part of his neighborhood seems to him to be a real man's work. To report on some epidemic of disease ravaging his own community is a real investigation to him. To study the milk-supply problem of his own city and to learn for himself how he may detect unsatisfactory milk is the proper start to make of him later a citizen who will intelligently enforce the provisions of the pure-food laws. A very valuable service could be rendered not only to the individual pupils, but to the community behind them, by instructing them in the actual handling of disinfectants, to learn experimentally how to make the proper solutions, and how to apply them under varying conditions. The public very much needs such instructions. Much of what goes for fumigation and disinfection is worse than worthless; it gives a false sense of security, besides being a sheer waste of money. With our newer knowledge that contagion is largely a matter of direct contact with infected objects, mouth spray, milk, etc., disinfection becomes a more definite procedure. To have a few sterile plates put into his hands with which to examine the bacterial composition of the air of the open room and of the closed room, to measure even in his simple way the infectious nature of the breath of others we breathe when conditions are unfavorable, is not only to inform him, but it is to capture his will to use this information for valuable ends.

The physiology of respiration and the problem of the "stuffy" room lend themselves well to first-hand study.[1]

[1] See Terman's chapter on the "Physiology of Ventilation," in his "Hygiene of the School Child," and Hill's pamphlet on "The Relation of the Atmosphere to Our Health." (Smithsonian Institution.)

"The Hygiene of Joy" in "I See You" at Sacramento, Cal. Two rooms made one

A great day for educational recreation in the Philippines

Two simple thermometers suffice for testing the whole matter of humidity and temperature. By keeping one bulb moistened and the other dry, we have a fine experiment to determine what difference in temperature between the two thermometers makes the air most comfortable, and what the rôles of humidity and temperature are in the problem of fresh air. The newly invented hair hygrometer with the thermometer attached gives both the temperature and the percentage of moisture by direct reading, the same as a clock. To have the pupil determine for himself, for instance, that with his body enclosed in the stuffy atmosphere of a box, closet, or room, the discomfort remains even when he may breathe through a hole or tube furnishing fresh air, while with his body in fresh air he may continue to breathe the bad air of the enclosed room without discomfort—this is to have him learn with a new interest what the whole problem of ventilation is. If this experiment seems childish at first glance, let it be remembered that just such experiments in the hands of physiologists have recently shown the fallacy that bad air is a problem of the chemical changes of respired air, "lack of oxygen and increase of carbon dioxide," and have proved that the puzzle of the stuffy room is to be solved rather in the physical changes of the enclosed air and the bacterial infection of the room. Neither increase of carbon dioxide nor decrease of oxygen are influential in ordinary ventilation, but the essential factors seem to be relative humidity, temperature, and movement of the air. The amount of exercise of the occupants also determines real, or cell, ventilation. Here the teacher may experimentally lay the groundwork for a further very profitable discussion of the merits of various proposed systems of ventilation for homes, public buildings, and public conveyances, and of exercise, than which there are few problems of greater hygienic importance to us all. In this field will be found the only effective campaign against consumption and kindred diseases.[1]

[1] See articles by Gulick, McCurdy, Bass, and others in the "Proceedings of the Fourth International Hygiene Cong.," Thos. Story, New York City, Sec.

In the matter of foods and the process of their digestion, there is at the disposal of the informed teacher a series of experiments so simple in their manipulation and so free from technical chemical terminology that they are entirely in place in the elementary school. The digestive ferments may be bought for a nominal price at any drug-store, and the process from starch to final sugars, and from proteins to peptones, and even beyond to the aminoacid end-blocks, may be viewed step by step and demonstrated by the simplest confirmatory tests. The details for such a series of experiments may be found described in practically any modern text-book on physiology and would be out of place in this discussion.[1]

III. Vitality and Reality

Reality vs. Technical Words.—The involved drawings purporting to show the anatomy of the nervous system or other organs should give way altogether in primary schools to actual demonstrations. Not infrequently the author of such an elementary text will include a drawing of the finer architecture of brain and cord paths that can be really intelligible only to a trained biologist, and means nothing to a child save a curious puzzle of lines. A frog with the brain pithed will explain more about reflex actions and the relationship of cord and centre than innumerable drawings without some concrete verification. The pupil whose time is taken to study the brain or eye has a right to study them in the only way that ever yields educational returns—he has the right to study these as real things, and not as shadowy symbols in words. When for any reason the actual things themselves may not be had, it would be better in many cases to omit such assignments altogether and proceed to other work with more substantial returns. The pupil interested in his camera, will be equally or more interested in its counterpart in the eye. To handle the crystalline lens of a beef's eye,

[1] See Doctor Rettger's book on "Elements of Physiology and Sanitation," A. S. Barnes & Co.—Ed.

Vital efficiency through physical education is emphasized in all Philippine schools

And is not disregarded in the best schools at home

to observe its elasticity and its manner of attachment to the muscles of accommodation, and to have a few simple experiments with improvised lenses, is to give the child a living knowledge of the laws of vision, that may lead to intelligent study of the care for his eyesight and that of those later dependent upon him. The defective vision among schoolchildren, which not infrequently seriously handicaps them in their development, often remains uncorrected because of the indifference of parents or guardians whose knowledge of the delicate structure of the eye or of practical eye hygiene has never gone beyond the conventional drawing of the eyeball in the text.

The possible experimental field in the study of the special senses is very great and admirably adapted to the elementary school. To test the acuteness of the sense of touch or pressure, to locate hot and cold spots on skin, to determine how judgments of size, distance, direction, color, perspective, and form arise, is to give to the pupil a chance to try the method of science as well as a background for hygienic and happy living.

In thus emphasizing the value of the experimental method in the teaching of hygiene, it may be well to note clearly that the heart of an experiment is by no means merely the handling of concrete things. An elaborate experiment may be almost as valueless as a formal bookish discussion of its terminology. It may be so covered up with directions and recipes that it enslaves as much as any arbitrary outline to be memorized. The heart of an experiment is the problematic situation with the mental attitude which it calls out. If this attitude is one of independent discovery and exploration, motivated by a genuine interest to know the truth in the question, it is an experiment of a high educational order, no matter how simple the apparatus or how elementary the mechanical execution. A gilt frame does not make a picture a work of art, nor do glassware and costly apparatus make a scientific laboratory. As the elementary schools are now

organized and furnished, it would be asking of the teacher the impossible to give the instruction in hygiene under the conditions of a well-equipped high school laboratory. The concrete work must fit into the complex program of the day, with its many demands upon the teacher's time and strength, and the experiments must be such that they may readily be at his fingers' ends.

Fortunately, the fundamental things in science are as a rule the very ones that react under simplest conditions. Then, too, it is by no means necessary that this concrete work should be a daily exercise. A telling experiment needs discussion and amplification; and, when possible, its obvious deductions should be made. At this point the text or other supplementary reference reading may be used to enrich the observation or verify the results. When all is done, a careful writing in good English of the entire procedure and its conclusions is most valuable, not only for the science directly concerned, but as a training in language expression. It will always remain true that the first requisite in using good English, as well as in teaching it, is to have something worth while to say.

Knowledge of Great Discoveries in the Field of Hygiene. —Finally, there are the classic experiments, which have paved the way to discoveries. These, of course, cannot be duplicated in the elementary school, but they may be studied historically to great advantage. To show how the truths of a science became known and to follow some of its epoch-making chapters is in a way to participate in the original investigation. Here the teacher of hygiene will find rich material.

Only a few instances need be mentioned. The life and work of Pasteur show in almost dramatic form the discovery of the modern germ theory of disease. The problem of yellow fever and the relation of the mosquito to it receive a new interest in the story of Doctor Reed and his associates, the American investigators who definitely proved the manner of the transmission of this disease, one of them sacrificing his own

life in the course of the investigation. In a similar way the researches of Ross on the cause of malaria will certainly enlist the pupils' interest in man's struggle to conquer disease. The achievements in the Panama Canal Zone have attracted the favorable attention of the whole world, and have greatly strengthened the hope that our modern knowledge of disease and its carriers may soon reclaim for civilization much of the tropical lands, and so enlarge materially the habitable world. A simple account of the campaign, now nation-wide, against tuberculosis, by the agencies of the open-air schools for anemic and consumptive children, the fresh-air camps and sanatoria, the stricter tenement laws of our cities, and by many other means—all this would tend to give the instruction dynamic qualities.

We must, of course, remember that the advanced methods of instruction of the colleges and universities, through their journal clubs and seminaries, may not be imposed upon the immature pupils of the grades or even high school. Our lower schools have not infrequently suffered because some teacher, fresh from the higher institutions, has attempted to transplant the curriculum of the university and to graft the methods of the college upon the lower school. Such educational mistakes cannot maintain themselves long. But it is equally wrong to go to the other extreme and deny the elementary school any participation in those methods which give to higher instruction its freshness and its vitality. The teacher of the upper grades and of the high school may, with the greatest profit to his class, report to his pupils the result of current investigations, and keep them informed, strictly within the limits of their immaturer powers of comprehension, of the status of some of the important problems, now so vigorously attacked for their solution. To keep in touch with the world's work in the field under discussion is for the younger pupil as truly an educational right as for the maturer college student, provided only that his touch be in terms that he can understand.

By this historical method the teacher may bring into his own schoolroom the very experiments and spirit of masters without the impossible task of performing them anew. When the experimental data of striking or important truths are too involved for the pupil, it is still good teaching to have him see some of the conclusions reached. Such interesting problems now current as the influence of the internal secretions in chemically regulating our physiological processes, may be made sufficiently clear to any pupil who has been asked by his text-book to study secretions at all. The psychic influence of gastric secretion, and the variability in the composition of the digestive liquids to conform to the changes in the food—these may be touched upon with a reasonable assurance of interest and profit.

IV. Experimental Hygiene

Purpose of Study of Experimental Hygiene.—There has thus been sketched briefly, merely by way of illustration, what a wealth of subject matter above the narrow and formal limits of his conventional text-book, the teacher of physiology and hygiene may command, if he will. If it be argued that such excursions out of the beaten track will make it impossible to cover the traditional ground, then let a new valuation be made to determine the desirability of following that path. There may be much that had better be passed by altogether. May we as teachers not sometime discover what a heavy load of useless educational baggage we ask the pupil to carry in his march through the schools? Luckily, not much of it will stick on his shoulders, but drops off because it is not fastened to anything. It has been merely piled on. Herein lies many a helpless child's protection against an overburdened course. As in the matter of food, so in the matter of knowledge, it is not what we gather, nor what we swallow, nor yet what we digest, it is only that which we assimilate that builds tissue. It is not the truths we hear nor those we remember merely, nay, nor those which we par-

tially understand—it is those which having been heard, remembered, and understood, are mentally assimilated and vitalized into conduct and action energized by an aroused emotion behind them.

The Teaching Aim.—This suggests a brief word about the aims which should motivate instruction in this field. There is no doubt that when physiology and hygiene was added to the school curriculum it was for the very definite purpose of safeguarding human life. Its aim was clear and unequivocal. The value of health as an asset needed no argument. Health is at the bottom of practically every human good. It is the great asset no less of an individual than of a people. It is the index of a thousand other virtues that follow in its train. Like all perfectly obvious truths, this regard for the value of health and physical efficiency was always acknowledged, but it has only in recent years received the careful and critical attention that promises more concerted efforts for better things in this matter.

Anything, therefore, that is calculated to promote correct physical living is proper subject matter for this branch of instruction, provided only that it is fitted to the pupils' power to comprehend intelligently and is more valuable than anything else that could be used in the time at our disposal. But such subject matter should not, in the upper grades at least, consist in the main of empirical rules to be followed unquestioningly. There is in all human nature a tendency to resist an arbitrary rule, but we all bow obediently to the consequences of facts once clearly discerned. To understand, even in part, just what physicians or sanitarians are attempting to do, and what the methods are which they employ, is far more practical in the long run than giving their formal conclusions only and attempting to reduce them to blind memory. It were well if physicians could more frequently instruct their patients; and already there are signs that medical men of the future will not be so exclusively confined in their practice to the "curing" of this or that disease, but will be community

leaders in campaigns of education for a better public health, as well as an aid in time of trouble. In the meantime, the teacher is the most available agent to prepare the way even for the scientific physician himself.

The patient who is advised to take the serum treatment for typhoid fever, for example, has a right to know what the point to this procedure is, and upon what scientific explanation it rests. Not only the patient but the community, too, should understand the physical reasons for such a course of treatment. In the case of hydrophobia there are innumerable superstitions current in almost every neighborhood. Some of these superstitions are so formidable as to interfere with the methods of relief. The Pasteur treatment is probably a complete mystery to the patient. He follows it, half hopeful, half sceptical. Has not the pupil in school the right to have this explained in the simplest of terms? The fundamental conceptions about acquired immunity are not too involved for the upper grades. They are in bold outline little more than the observations already familiar to him in a number of diseases, that one attack of a disease tends to make the person more or less immune to a second. It is not necessary to go into the minute and confusing details about the many kinds of antibodies. There is no necessity to talk about "side-chains" and "receptors" and "complements." The teacher who knows the child's mind will not make this mistake. But the general conception of antibodies is no more difficult than the matter of pancreatic secretions.

The boy or girl on whose farm the cattle have been officially inspected and tested for tuberculosis should be told by his teacher of hygiene what it all means, without entering upon the technical theories about it. How the school physician tests the throat for diphtheria, and how a positive test looks when incubated, are problems easily comprehended. When they learn that health officials may take a few droplets of blood to determine if the patient has typhoid fever, it must surely awaken in their minds a genuine curiosity as to how

such a thing can be done. They know that it is done, for the local physician has perhaps made several such tests, but the procedure is entirely meaningless.

And yet the test may be explained in a few minutes to any mature pupil, so that he will not only see its scientific reason but appreciate in a new way what cure and recovery really mean. The student should know what the antitoxin is, how, in a general way, it was produced, and what the injection of it is meant to do. If the community of the future is to be saved from the follies of quack remedies, advertised "cures," and ancient superstitions, it will be because it has learned what medicines can do, and what they cannot do. The modern treatment for disease, with vaccines, or sera, or bacterins, may be far from satisfactory and leave much to be desired, but a simple, popular understanding of them will forever make impossible the blind reasoning that, inasmuch as they do not know what causes a disease, there is no telling what may cure it. Thus the absurdest vagaries receive a sympathetic hearing. Our popular vice in the indiscriminate use of "sure cures" flourishes, in large part, because the scientific explanations of our achievements in preventive and curative medicine have been generally withheld from the public. The dry bones of anatomy and physiology have been studied instead of the science and art of health and hygiene.

Health Data to be Utilized.—The inexorable law of cause and effect in the field of disease may be frequently obscured in the individual case, but it may be shown in the composite picture of the vital statistics of a community or state. Such vital statistics, if accurately made and correctly interpreted, and then compared from time to time, give a moving picture of the greatest significance. They show in what direction things are moving and which forces are gaining. Such vital statistics may be a social chess-board on which the movements of cause and effect may be followed. It is a handicap to health officers that the public so generally is unable to see

in these statistics little more than the red tape of prescribed reports. To enable the maturer pupil to read beneath and between the numbers of such reports, and to sense the drift of society in the important matters shown by these official records, is to perform a service well worth place in the health instruction of any school.

V. Broadening the Scope

Scholarship and a Broader View.—In the foregoing it has been the aim to indicate to the teacher how rich and varied is the field from which he may draw his material. If it seems that these suggestions assume too much scholarship or training on the part of the teacher, it still remains that to the growing instructor these suggestions may at least stimulate him toward further study on his own part. There are few things in education that so vitally affect for good the work of a school as an aggressive and growing scholarship possessed by the teacher. For him who is inadequately trained and who is indifferent about it there is no help. It is believed that the examples here given are indicative of a class with which many, perhaps most, teachers are not entirely unfamiliar. However, it remains true that these suggestions of how hygiene may perhaps be taught more effectively, are offered not because they will make the ascent easier for the instructor, but because it is hoped they will lead to lookout points, where the view is clearer and more commanding.

Sex Hygiene and Sex Education.—There has recently come under increased discussion another phase of hygienic instruction not yet referred to here. This is instruction in so-called sex-hygiene. Of the necessity of safeguarding the young against evil influences, only too apparent almost everywhere, there can be no question. Just how this may be best accomplished is the only thing in controversy. The public and formal teaching of sex-hygiene is unfortunately still an uncharted sea. Before we are fully informed about it, it will have to be tried out by wise and capable experimenters under

conditions that will test its weakness and its strength. In the meantime the instructor genuinely concerned about the higher welfare of the pupils under his care, need not be passive in this matter. In emergencies it is still possible for the teacher to extend a friendly but warning hand to some boy who seems to be losing his moorings, or to take the part of a bigger sister to the thoughtless girl ignorant of her directions. This individual counsel and the maintenance of a wholesome and moral tone in all the activities of the school will be found to accomplish much, and will be free from those possible dangers that lie in the formal public discussions of this theme, so easily ill-timed and so readily misunderstood. The purely biological facts may be presented in connection with the study of plants and lower animals, and the pupil himself be trusted to translate all this into higher terms.

Scientific Temperance, Drugs, and Narcotics.—The problem of teaching "scientific temperance" and the effects of drugs and narcotics also demands a wise caution on the part of the instructor. So much careful research work has been done recently in this field that the teacher should familiarize himself with the actual results obtained. These are sufficiently positive to permit a vigorous campaign against all forms of intemperance on the strictest physiological grounds. But this newer knowledge will save him from those loose statements, often lurid and exaggerated, which tend to bring into discredit the substantial facts themselves. Not only medicine, but business, factories, and shops have all spoken in unmistakable terms about the inefficiency of the user of alcohol, and indicated his gradual elimination from all fields of responsibility, and this not so much for sentimental or moral reasons as for the cold physiological and economic reason that a drinker's services do not pay.

Formal and Informal Health Instruction.—There still remains to the teacher the question how the instruction in hygiene shall be apportioned to the different grades of the elementary school. The customary plan to defer *formal* in-

struction in these subjects to the sixth, seventh, and eighth grades is probably a wise one. But much may be done in an incidental way in the lower grades. The simple lessons of cleanliness, the care of the mouth and teeth, the ordinary habits of correct living, the insistence on fresh air, all these should be demanded of the children, until obedience to them is naturally and cheerfully given. Learning to do by doing at home and at school, with incidental explanation, is the principle here—that of habit formation. With advancing grades the reasons or scientific principles underlying these demands may be more systematically presented. Correlated with other lines of work, hygienic or sanitary matters may be introduced, and an open period now and then to present matters of timely interest or necessity will enable the teacher to lay a basis for the formal instruction of the upper grades. In this the instructor cannot go far astray; if informed himself, he remembers that the minimum essentials are at least two. The pupils should have first such a knowledge of the location, structure, and function of the important organs as to appreciate that the body is an organism able to flourish only in obedience to definite and rational natural laws. The pupil is not to be a surgeon, he is not to be a physiologist; thousands of details may be spared him. But he is entitled to the vision even in his simple exercises in hygiene, that law and order prevail in living tissues, and so enable him later to sense the distinction between a fact of life, and the many current superstitions. In the second place, the pupil should learn enough of the problems of hygiene, sanitation, and the fight against disease to understand the value of efforts in this direction, and to give intelligent support to all worthy movements of society which have for their object the conservation of life. In the securing of these practical results the inspiring teacher will find that he has been dealing with subject matter capable of yielding not only valuable scientific training, educative in broad and liberal ways, but he will be laying the foundations that will give us a new generation of

better-informed men and women, who will in a more insistent and telling way carry forward a great social campaign for longer and more effective living.

The New Campaign for Longer and More Effective Living.—The hopes of a forward movement in matters of health rest upon two things: In the first place we must wrest from nature a knowledge of the conditions of disease, their causes and their prevention. This is the function of investigation and research. It is the work that devolves upon universities and scholars everywhere, who are attacking at first hand the unknown borderland before us.

Surely no one can find fault with the achievements in this field. Few investigations, if any, have yielded such brilliant and such important returns as those which have to do with disease and preventive medicine. Liberal appropriations have been forthcoming to push our knowledge further and to gain new insight into problems still unsolved. Every person interested in better living conditions should regard with the greatest favor and concern every encouragement given to research and investigation. In spite of the achievements of the past, new light is sorely needed on many points. We are still largely in the dark about cancer. Even with diseases now partly understood there remain innumerable secondary questions which wait upon further study.

In the second place, all hopes for a forward movement in matters of health rest upon the proper and intelligent dissemination of this knowledge given us by the scholars. Science comes, but habits linger. Here our achievements have not had the success naturally following research and investigation. Our expert knowledge is many, many years ahead of the interpretation and appreciation of this knowledge by the general public.

The gap between the research laboratory and the general public is at present too wide for the dynamic spark to leap. Our regrettable situation is due, not so much to the lack of expert knowledge of what should be done as to our inability

to have this knowledge exert its full influence in the actual world of affairs. The real problem, then, before us is to find agencies that shall bridge this gap. We have many such agencies at hand. The magazines, the health departments of newspapers, the public health lecture, and so on, may all serve this valuable purpose, even though at present they often fail to do so.

The most effective agent, however, is *the teacher*. It is he who must in large part carry the program of the scholar to society. It is thus of the utmost importance that the teacher should understand the high function that is his.

Since even the best systems of medical supervision, using both nurses and physicians for inspection, examination, and follow-up work, require a great deal of *teacher* supervision of pupils while nurses and physicians are not in the classrooms, it is necessary that teachers inform themselves on the principal symptoms of ailments and defects and be on the watch for them. The state of New York, through the State Education Department, helps teachers to meet this responsibility by furnishing each with the following chart of signs of ill-health and physical defects which teachers may well keep before them, and use in safeguarding the health of the children in their charge. Copies in the form of cards to lay on the teacher's desk may be had by writing to the above department at Albany, N. Y.

In matters of health there are certain things that are crying for immediate attention. From one-seventh to one-tenth of the entire community dies from tuberculosis alone, and this a disease not only easily curable in its incipient stages, but readily preventable altogether, if we could only set the proper social machinery in operation to deal with this scourge. Typhoid fever, so generally prevalent, could not exist in a community thoroughly informed and aroused in matters of simple sanitation and sewage disposal. The frightful infant mortality could be greatly reduced if we could but impress upon the public simple rules of health for little chil-

dren that even an uneducated mother could readily understand.

Hundreds of school buildings, insanitary and unfit for children, exist because communities have not fully appreciated the terrible cost involved in loss of health and educa-

Suggestions to teachers to read the

HEALTH INDEX OF PUPILS

1 Posture
   a sitting
   b standing
2 Emaciation
3 Color, pallor or flush
4 Unusual dulness or sleepiness
5 Activity, physical
6 Teeth, malposed or diseased
7 Mouth breathing
8 Frequent absences
9 Bad behavior
10 Inattention
11 Delinquency in studies
12 Defective vision or eye symptoms
13 Defective hearing
14 Nasal voice
15 Discharging eyes, nose, or ears
16 Skin diseases or pimples
17 Overdevelopment, physical
18 Underdevelopment, physical
19 Twitching of eyes, face or any part
20 Offensive breath
21 Sore throat
22 Cough
23 Enlarged glands, front or side of neck
24 Uncleanliness
25 Scratching of any part of body
26 Frequent requests to go out
27 Vicious personal habits
28 Headaches
29 Other bodily pains
30 Limping, or deformity
31 Stuttering, or defective speech

This health index card should be placed on teacher's desk for daily use and reference.

The teacher should promptly notify principal, medical inspector, or nurse, of such pupils as do not present a normal health index.

An abundance of fresh air, pure water, wholesome exercise, and nourishing food, with regular habits, will do much for the health of TEACHER AND PUPIL.

tional results. Thousands of school children sit through their years of study handicapped by physical defects which could be readily corrected if indifferent fathers or mothers could only be made to understand in a convincing way their duty in the matter.

Homes and public buildings, street-cars and trains are still often superheated, ill-ventilated, and are prolific breeders and spreaders of disease, because people fail to understand

the simple physiology of respiration. Our cities tolerate dirty streets and dust-laden atmospheres because the average citizen does not know their final effects. Perhaps we cannot blame the ordinary man when he is not deeply sensitive to the possibilities of infection around him, when he has never seen a pathogenic germ, nor witnessed the simplest experiment with bacteriological cultures. To him too frequently the warnings of the health official seem little more than the attempts to frighten him with imaginary bogies. It is altogether different with the informed person who has seen these agencies of infection in actual concrete outline before him. Disease and its consequences are such terrible realities, and the love of life and health is so strong and so universal, that we are assuredly correct in believing that society, once thoroughly informed by the concrete facts presented to it, will not hesitate to put in operation the entire social machinery to achieve the desired results. To bring this fortunate day nearer is the high function of the teacher of hygiene.

How to adapt his instruction and training to his children and community will tax his best educational methods, and these methods may vary with different localities. His purpose, however, will rise above merely academic ends and have a genuine social and ethical value. It will be so to teach that those receiving instruction shall have life and "shall have it more abundantly."

SUMMARY

Restated very briefly this article has tried to emphasize among others, the following points:

1. The subject matter of hygiene for any teacher is that bit of knowledge or that training in conduct which will most effectively further the interests of health. This subject matter may vary in different places as sanitary and hygienic needs vary. But varied as the subject matter may be in details, it is everywhere unified by a definite and common purpose, that of increasing the physical efficiency of the pupils.

2. The teaching of hygiene must not be strangled in the meshes of a stereotyped discussion of a bookish text. The study must overflow the confines of the classroom and touch life on the outside. It must open the eyes to neglected streets and alleys. It must find the open well and the sewage contamination. It must demand open windows and fresh air in home, school, shop, or church. It must view the milkman critically, and insist upon proper handling of all the food-supplies.
3. It must invite medical inspection and give intelligent obedience to expert direction. It must learn the utter futility of quacks and nostrums, and see new curative properties in all things that contribute toward normal hygienic living.
4. It must tend to make future citizens, who will give a generous support to all public movements intended to combat disease, and a cheerful obedience to the rules formulated by the proper health officials.
5. It will make clearer than heretofore what the scientific physician *can* do, and what he cannot do.
6. And not least, it will forever change the blind hopes attached to the curing of a disease when it appears, to an intelligent appreciation of that ever-widening field of knowledge, which is to play a new rôle in the *prevention of disease.*

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CHAPTER XIX

PHYSICAL EDUCATION

Preliminary Problems

1. What has been the effect on child experience of the modern tendency to do away with industries in the home?
2. What has been the effect on the school of the tendency of the home to shift burdens to the school?
3. What is the danger of our dependence on highly complicated school ventilating systems?
4. What are the dangers of confining children for long periods to school furniture?
5. Where no organized play exists, how do children pass their leisure time?
6. What are the differences, as regards social unity, in the modern city community, compared with the New England community of fifty years ago?
7. What are the effects of lack of exercise on the body; on the mind?
8. What is the "gang," and what are its tendencies and dangers?
9. What questions could you ask children of an elementary school class daily which would tend to lead all to improve their habits of home hygiene?
10. What modern movements (*e. g.*, the Boy Scouts) are tending to bring back to children opportunities for normal physical development?

I. The Problem of Normal Physical Development and Health.—Changing social conditions, city life, with its lack of play space and play material, the loss of physical activities in the home, longer confinement in school, and country life which is not promoting health as it should, have given rise to physical conditions in the growing child which are to-day seriously detrimental to the child and to the race. The school is probably the best and at present the only public organization through which these defects may be corrected. Therefore, we must insist that teachers give their pupils active, body-building, physical exercises, games, dances, and other

vitality-creating activities. The highly artificial character of the modern school and its life makes necessary more formal types of physical education than would be possible where a large part of each child's school work and play would be motor activity and physical occupations such as Professor Dewey idealizes.[1]

It is probably justly asserted that the children of to-day do not know how to think; but this is not entirely the teacher's fault; it is largely the fault of the home. The home has thrown more and more of its responsibilities upon the teacher. She teaches the child his gymnastics; helps him organize his sports; directs his reading; arouses his love for the flag; guides his development toward citizenship; teaches the boy to carve and construct and the girl to cook, to sew, and to make up beds; she is also expected to keep watch and guard over the pupil's eyes, his ears, his teeth, and his morals.

In fact, the chief responsibility left for the home is to clothe and feed the child. If the truth were known we should find that the teacher even helps out frequently in the clothing. And if you chance to see the girls come into our high and even elementary school gymnasiums with stilts under their heels and corsets about their waists, expecting in that condition to do gymnastics, you will feel that the school should have something to say about the clothing. And when we discover that at least three per cent of all the children in our grades have anemia and about four per cent suffer from malnutrition due to faulty diet, all will believe that we must make some provisions for improving their feeding, as have already been made in many places, either in helping the home to improve the diet with little increase of cost or actually feeding all or certain children at school, or both. As social needs and conditions change so must the school make progressive adaptations to human needs.

II. Need of Physical Education.—The child should properly be taught to think at home by practical problem-solving

[1] "Democracy and Education."

methods; even Socrates himself could not have taught his pupils very successfully in files of eight and rows of five, with little time for contemplation. Physical education, including organized play, can be so directed as to teach pupils to think. Why? Because here they learn to do and work out things and meet problematic situations in play instead of merely receiving instruction about them. At its best the method is that of co-ordinated self-activity, both mental and muscular, not passive, sedentary absorption of the ideas of others.

Probably never before has the public been so aroused to the needs and value of child welfare as at present. We see this evidenced all over the country, particularly in a multiplicity of laws regarding child labor, working hours for women, compulsory school attendance, medical inspection in schools, tenement-house laws, playground agitation, and in the great revival and improvement that has taken place in the teaching of gymnastics and athletics.

School systems are everywhere being enlarged to include physical education, and the physical-education departments are being increased to include more and more diversified branches of the art, until we have not only the directed classroom work, but games, athletics, folk and esthetic dancing, playgrounds, school gardens, recreation centres, and other forms.

About ten per cent of our school children suffer from spinal curvature, due quite largely to confinement for long periods in unsuitable school furniture. This bad custom we must stop. Certain breaks in seat work are absolutely necessary to save the child's nervous system from becoming unbalanced by the combined pressure of present-day school work and the excessive stimulation of modern complex civilization. These breaks must be as strong a contrast to the school work as is possible under school conditions, and to get this contrast we must do active physical work. The physical-training periods, therefore, must come at such intervals that practically every two study or recitation periods are separated by

one of exercise; and the exercises given during these periods must be of such a nature as to stir the blood, invigorate the lungs, and contract and relax the large muscles of the thighs and body that have been stretched and wearied by sitting.[1]

Physiology of Exercise.—In addition to providing changes from the continued desk and blackboard work, these periods rest and build up the body.

What are the objects of exercise? They are four:

1. Restoration to a normal physical condition; that is, *medical or corrective gymnastics.*

2. Preservation or development of physical vigor; that is, the upbuilding of muscular, nervous, respiratory, circulatory, and nutritive energy and growth, what might be called *hygienic gymnastics.*

3. Development of skill and better control of the neuro-muscular mechanism for certain mental and moral effects. This we may call *educational gymnastics.* This group may assume special types, as military for warfare, esthetic for expression, industrial, as manual training, and other constructive activities.

4. Diversion and social enjoyment. This is largely recreative, as games, athletics, dancing, etc., *recreational gymnastics.*

Now, briefly, what are the effects of exercise? The muscles make up about forty to fifty per cent of the body weight. Under exercise they gain in efficiency and endurance and change in function and structure. Nerves change in form but not in number; the nerve-cells branch out, and the nerves themselves transmit impulses more readily. The bones become larger and firmer and the muscular attachments roughen and become stronger. The respiration becomes faster and deeper; the heart-beat is faster and stronger; the arteries dilate and perspiration increases. The heart-beats being more powerful, the big arteries are put on the stretch; the elasticity of these forces the blood through the capillaries in a steady

[1] See the chapter on the "Physiology of Ventilation," in Terman's book on "The Hygiene of the School Child."

stream; the increased respiration draws the blood from the big veins and the contractions of the muscles force the blood from the small veins into the large, and the rate and volume of circulation is increased.

If excess of work happens, we get increased blood-pressure; more blood is carried back to the heart than it can take care of; therefore arises breathlessness, a better name for which would probably be heartlessness. "Second wind" is due to the adjustment of peripheral resistance to this increased return of flow.

By this alternate pressure, by the muscular contraction on the lymph-channels, and by the release of muscles, the lymph is renewed and freshened. Exercise also improves digestion, both by increasing the blood flow and the amount of waste. There are many other effects which we have not time here to discuss.

By stimulating the circulation, exercise not only builds up tissue but cleans waste products from the brain and nerve-cells, with the expected result that the learning process is improved. After suitable exercise children grasp problems more quickly and with increased accuracy, and their general mental alertness is increased.

Moreover, physical training is educational of and by itself. Learning to do new things increases the reserve power of the mind. The mere acquiring by the human race of the ability to separate the thumb from the rest of the hand developed a whole new brain area. The child largely relives the history of his race, and this is particularly true of his motor acts and impulses. All of the arguments for motor activity as education, growing out of the modern study of educational psychology, apply to the manifold phases of physical education.

Progression in Physical Education.—The baby at birth has sufficient grasping power in his hands to support his weight by holding to a cane, and brings with him into the world a strong instinct for general physical activity. At successive stages the child is impelled to do certain things and

to play certain games. At an early age he delights to run from mere love of running; later the interest lies not in the mere running, but in the race or competitive game of which the running is a part; that is, the instincts of the chase, and of competition and co-operation have come in. As he grows older the type of motor activity that appeals to him changes. For this reason, in any system of physical education worthy of the name, the exercises, games, etc., are graded to correspond roughly with the age. We strive to lead the pupil on in his motor development as rapidly as possible, thus securing increased mental power as well as building up a strong, developed physique with and through which his mind may work.

III. The Rich Past of Physical Education.—Probably no nation as a whole ever acquired such physical and mental perfection as the ancient Greeks. Their statues of both men and women have been recognized as the perfection and ideal of the human race. In the building of their cities the first municipal building established after the market-place was the gymnasium.

The two almost distinct civilizations of Greece, those of Athens and of Sparta, differed considerably in their methods of getting this perfection. The Spartan idea, closely allied to certain national ideas of to-day, was to build up a perfect race for military purposes. The ruling class at Sparta consisted of a handful of militant conquerors surrounded by a horde of slaves. In order to maintain its supremacy, the dominant race must be kept physically perfect. Hence weakling infants were destroyed; and the child was taken at the age of seven and educated by the state for the purpose of becoming a soldier, if a boy, or the mother of soldiers, if a girl.

The Athenian idea closely simulated the present English idea that every gentleman owed it to himself and family as a matter of course to become as near physically perfect as possible. As the modern Englishman takes his football, cricket, riding to hounds, and other athletics as a necessary and desirable phase of life, so the Athenian considered as highly

important his gymnastics and bath as a part of his daily routine. It was here largely a case of physical training for its own sake as a part of a liberal education and a freeman's mode of life rather than from any ulterior motive, although the exigencies of war were not forgotten. The Spartan system was put upon the people by the socialistic government, while the Athenian was more spontaneous.

Rome was at first in much the same condition as Sparta—an armed camp in the midst of a conquered people. The training was in the arts of war for warlike purposes. As their civilization grew older and became more luxurious and corrupt, the Romans took their gymnastics vicariously, sitting on the bench at the circus, just as probably most American men take theirs at the ball game on the bleachers; only nowadays, instead of turning down thumbs for an unfortunate gladiator, they thirst for the blood of the umpire.

After the fall of Rome, physical education, like other arts and sciences, went through its dark age. It was later revived for a few by the necessities of warlike training, and in the joust and tournament of the Middle Ages we see an approach in chivalric education to our modern athletic meets. However, up to about 1800 physical education was practically non-existent for most people, except as it came about in the daily duties of life. Soon after this time there came a revival in gymnastic interest in Germany, in which also the underlying motive, inspired by Jahn, was patriotic and military, and the movement in Sweden of a more strictly educational character, led by Ling.

In America the first efforts of any note were in 1820. Many schools and colleges adopted some gymnastic work during the next ten years, but the flickering flame soon died out. There came another small spurt, led by Dio Lewis, about the time of the Civil War. But the great impetus of the present movement started only about twenty-five years ago, although some of the colleges had built gymnasia before that time. In the last ten or twelve years, however, has come

the great playground movement, which is one of the popular outbursts of the age, a veritable "revival of the physical conscience of the race."

IV. Principles of Physical Education.—In planning a system of physical education for children, what must we consider? Whatever we do, we must keep firmly fixed in mind that we are educating as well as building physical tissue. The great aims of social efficiency, such as health, recreation, and vocational, moral, and civic ability must be kept ever in mind. Physical education can be justified and selected on the basis of its relative contribution to these elements of the general aim. Any exercise, to secure the greatest possible value, must also be interesting to the individual, as well as vigorous or socializing. This is why one gets so much more benefit from a good gymnastic game than from pulling chest weights or taking any other form of solitary or artificial exercise. The whole problem of motivation comes in. Growth is rhythmical, and we must also utilize and develop the instinct and sense of rhythm for recreational and other ends. Then, too, a good system teaches the child to think along certain lines; it must not be wholly nor largely imitative. He must be taught, so to speak, to think in his feet, in his spine, in his shoulders, etc. Thus only do we get proper walking and proper poise and posture, with straight, flat back, erect head, and prominent chest. In time this thinking is replaced by habit and good carriage is fixed.

This evolution is a moral as well as a physical training. It should inculcate immediate, unquestioning obedience to lawful orders, as well as initiative and spontaneity. As man has gained his erect attitude his civilization has improved, and as a child gains physical poise he gains mental and moral poise and thinks better of himself and of his position in the community. The physical slouch is frequently also the mental and moral shirker.

The experiment of the Gary, Tuskeegee, and other schools where physical education is very definitely connected

up with the ordinary physical work and recreation of pupils is very suggestive but not applicable to most school systems with formal class work, seats screwed to the floor, etc.

Practice of Physical Education.—Such, in brief, is the theory upon which physical education is based. Now what must be our practice? First, the work must be so laid out that interest is kept alive and the child is continually learning and looking forward to something new. Therefore the work is graded, whether it be formal exercises, games, rhythmic exercises, athletics, or higher gymnastics. Second, all the work, if in classroom, hall, or gymnasium, must be done in fresh, "unbaked" air, with windows open at top and bottom, or, better still, carried on when the weather is suitable in the open air of the school playground. It is only with plenty of cool, outdoor air that we can get satisfactory results. School ventilating systems are designed for seated children, and do not always give enough air even for these; and when children become physically active, they use at least four times the normal amount of air. There is often a fight to get the windows open, owing to the opposition of janitors and the fear of extra heating cost on the part of boards of education. In the Minneapolis schools the windows are open top and bottom at physical-training periods, and at recess, six times a day, by order of the board of education, and by the same authority the standard schoolroom temperature has been reduced from 70 degrees to 67 degrees.

The various types of physical education mentioned above, such as formal exercises, games, rhythmic exercises, athletics, and higher gymnastics, while distinct, are all interdependent and closely related. The formal exercises, mass work, or calisthenics, whatever they may best be termed, are designed to be as vigorous as possible under classroom conditions, and also corrective. They provide for much stooping, bending, and general use of the big muscles, as well as for chest-expanding and spine-straightening, and are done mostly by command.

It is necessary in such exercises to insist upon absolut obedience to lawful command, as well as to the rules of a game or play. By every means we should foster the spirit of fair play. The most harmful factor in games and athletics is lax or non-enforcement of the rules. The child who breaks the rules of his games with impunity will probably, through habit, have a disregard for the rules of the community; he becomes "lawless."

Next to obedience and respect for the rules of the game comes attention. Muscular movement has little stimulative effect when it has become purely mechanical. The new is not mechanical; therefore a great variety of movements, games, plays, etc., is essential to the best results. It is desirable to use each play or game only a few days without change.

Plays and games, too, tend to develop not only physical strength, health, endurance, bodily resistance, and certain skill, but also such moral qualities as courtesy, chivalry, and loyalty. Teach the children to play the best games possible. The play loafer probably tends to become the work shirker.

V. Directions to Teachers.—In carrying out any course in physical education, the teacher should keep in mind the close relation it bears to the lessons in hygiene that are taught in the grades.

During all recesses and physical-training periods, except when the weather is very inclement, the windows should be open to the widest extent, both top and bottom. Whenever possible, exercises should be held out of doors. In buildings having large, airy corridors, exercises should frequently be held there, so far as size of classes permits. When windows cannot be opened because of the violence of the wind, it is possible in buildings having fans to drive unheated air into the rooms at physical-exercise periods without creating drafts. The air-heaters may be shut off from the air at these periods.

Teachers will strive especially for correct carriage. See to it that children at all times sit, walk, and stand correctly.

The attitude while sitting at the desk is very important, as many cases of lateral curvature of the spine in young children are most probably due to faulty attitudes. By developing the *ideal* of good posture, by holding up fine ideals of posture through literature, statuary, pictures, and examples of children and adults, this standard will best be attained. In the physical-training drill, special attention should also be given to correct form. No exercise is very beneficial if the child is allowed to stand with drooping head and flattened chest.

Give commands sharply, cheerily, and vigorously. On the vim and spirit of the command largely depends the vigor of the reaction.

Exercises calling into action large groups of muscles take more time than those using small groups of muscles. For instance, a body movement must be made more slowly than one of the arm or forearm. Body movements and respiratory movements may be made so rapidly as to be dangerous. Respiratory exercises should be given slowly, with slight pause at the end of expiration, never at end of inspiration, since holding the breath has a bad effect on the circulation.

As every effort should be made to counteract the cramping of the child which nearly all desk work causes, the windows should be opened widely at frequent intervals and the children exercised vigorously on their feet. This is best done by two-minute interrecitation periods of vigorous running or a fast game at about 9.30, at 11.30, and again at 2.00 P.M., in addition to a regular ten-minute exercise period at 10.00 A. M. Many prefer a program that places the long period at 11.30, as this is probably nearer the time of greatest mental fatigue. Or one may use any vigorous game, preferably those with running and stooping in them.

Children should be urged to wear the low, sensible, flexible shoe, such as athletes wear, and to avoid those with pointed toes or high heels. They should also be taught to avoid tight clothing. The young girl in a tight gown is neither graceful nor attractive; she is merely silly.

There are two kinds of command: (1) The *preparatory* command, which tells what is to be done, and (2) the command of *execution* which starts the action. There should be long enough pause between the preparatory command and the command of execution for the pupil to understand what he is to do. The tone of command must be distinct and animated and its loudness regulated by the size of the class and the outside noises. Do not shout. Indifferent commands produce indifferent results.

There should be some marching; and wherever possible one may amplify this to figure marching for the development not only of rhythm and co-operation, but of attention, since a child cannot march in wheels, circles, and figures, unless he is attending to his work. We should reasonably expect here, perhaps, some spread of the training in attending in figure marching to attending in other co-operative exercises of a similar character.

VI. Methods of Physical-Education Exercises.—In the lower grades the exercises may be made occupational in type, *i. e.*, imitative of occupational activities with which the children are already familiar. This is becoming a more and more difficult requirement to meet, for, as cities grow, children see less of occupations and then only a fragment here and there. Such exercises have a strong appeal to children of this age because the imitative instinct is then very strong. In the upper grades the occupational exercises may disappear and their place be taken (when children and teachers have been at the work long enough to enable them to accomplish them in good form) by exercises selected from athletics, such as imitations of golf-club swinging, shot-putting, etc., and also heaving, body-bending, and vaulting exercises on and over the school seats and desks.

Games and Play.—The second group we may call games. We should try to keep alive the spirit of play. Through lack of a desire or ability to play, whole communities are deteriorating and have become grave national problems. I refer

especially to England's great-mill cities. For generations these people have been mill-workers. Not only the fathers and mothers but the children have spent practically all their waking hours in these great hives, with no pleasure and little hope. Several times during the past twenty years English military authorities have been obliged to lower their standards as to height, weight, and chest measurements, in order to get the proper proportion of army and navy recruits from these localities. The recent war has revealed still greater physical deterioration. We are in great danger of having this happen in our large cities here, especially in cities having large industrial plants, and also in the country, where so often recreation is taboo and "all work and no play" is the rule of life. Rural recreation for young and old is for the future to develop. The best preventive of this menacing condition is play.

While the tendency to play games is inherited through the generations, the games themselves are not. They must be taught. Games have always been taught children, but largely by other children, since most adults have forgotten them or are engrossed with other matters than the education of their children. In mixed cities the games are not transmitted, because of race prejudices, differences in religion, differences in social status, and because of the lack of a place to play. Mothers formerly played with the children, but under modern city conditions this has largely disappeared. There is little privacy, and mothers are frequently working outside, are at the club, or are otherwise engaged. There is too little sense of community unity, neighborliness, mutual confidence, and friendliness among the parents, in city or country. This unfortunate state of affairs has had a particularly bad effect upon the girls. In many communities they have been brought up to believe that any active game or sport is unladylike.

Then, too, the mere fact that children as a rule are dressed in finer clothes than they were fifty years ago acts as a brake

upon play. The continual "now don't get dirty, Johnny," has had its marked effect. When Johnny lived in the country and hitched up his trousers with a nail, nobody worried about his keeping them clean. The fewer children in the isolated farm homes, the few children at the typical non-consolidated one-room school, the fewer picnics of the growing number of tenant farmers, and other features, make even the advantage of suitable clothes for play of little importance. The cities have plenty of children but little or no place to play; the country has plenty of place to play but too few children congregated in one place. The consolidated school helps solve this problem for the children.

As a result of these conditions it has come to pass that, for the first time probably in the history of the world, it is necessary for adults to teach children how to play and to teach them games. These range all the way from dramatization of nursery rhymes, through the old folk-games, to the less highly organized modern games. In using games we must keep in mind the need of frequent change. Teach two or three games; let the children use them for two or three weeks; then teach some more. The child of six particularly enjoys games in which there is much repetition, as in most singing games, such as "Farmer in the Dell," "Looby Loo," "Jolly Miller," "Round and Round the Village," and those which require the impersonation of an animal or a person, as "Cat and Mouse," and those games of simple chase requiring little demand on the powers of prolonged attention, of few rules, and quick climaxes, such as "Bean-Bag Passing Race," "Crow Race," etc.

The great value of these games is in their proper adaptation to the age of the pupil and in the intense interest which they arouse. At the age of admission to school the child is in the midst of his dramatization age; therefore the nursery-rhyme plays appeal to him very strongly. As he gets a little older the tag and catching games have their vogue; then come the racing games and the competitive games of the less

highly organized type, such as those where an entire group must be caught, as in "Pom Pom Pullaway," "Prisoner's Base," etc., group competitions, such as relay races, and mass athletic competitions. In these games we begin to get a start in building up the sense of loyalty and the subordination of self to the interests of the team or "side," although this probably does not reach its best stage until a later age, when we see it in such games as baseball, football, and basket-ball.

Rhythmic Work and Dancing.—Closely related to the simplest games, and perhaps more closely related to the formal exercises, come the rhythmic exercises, such as fancy steps, folk-dances, and esthetic dancing.

The more active forms of dancing secure in the highest degree the physiological effects of exercise. Probably, in addition, the most important function of dancing is in training the sense of dynamic equilibration, the equilibrium of the body in motion, and in cultivating the sense of rhythm. These build up and accentuate the sense of rhythm, and inculcate grace and co-ordination of movement, as well as tend to break down and prevent the horrible self-consciousness of early adolescence. They are vigorous enough to be builders of the body and of lung power. Being oftentimes combinations of steps and body and arm movements, they are also corrective. They are also co-operative, social activities possessing great recreational and social value.

Rhythm is a fundamental instinct. The automatic foundation of the mind has the original tendency for rhythmic action continually increased by habits passed over from conscious control. In mental growth the subconscious mind increases its content as the conscious mind increases its accommodation, and passes more and more acts over into habit. Thus this acquisition of the habit of grace and equilibrium builds up mental as well as physical poise. At any rate, the instinctive love of rhythm can be utilized for desirable educational ends, such as habits of harmless enjoyment, sociability, co-operation, respect for the opposite sex, etc.

Swedish folk-dances are much enjoyed in Minneapolis

Prospective teachers learning to play at a normal school in Pennsylvania

Those who have attended an old-fashioned religious revival know the supremely important part that rhythm in the form of music, poetry, the cadences and rhythmic flow of speech, and even the more or less conscious rhythmic motions play in swaying the emotions.[1] The effect of poetry is due largely to rhythm, whether it be doggerel, Virgil representing a cavalry charge, or Kipling's majestic "Recessional." The war-dances of savages, the occupation-dances of the peasantry, the love-dances of the East, all show how fundamental is this sense of rhythm, and how early in race history it is translated into muscular activity. Dancing is undoubtedly next to the oldest form of gymnastics, the oldest being the practice of acts of war. Probably the rhythmical march of the processional is directly descendent from the old Greek dances, and these probably had the remotest of origins.

Physical education is valuable, not merely because it helps preserve the health, nor because it enables the child to accomplish more storing up of educative experience in a given time, but because it is educational of and by itself. The mere learning to do new "stunts" or the learning of complicated exercises, such as wand or club drills, develops certain valuable mental habits, trains new nerve connections, adds to the general efficiency of the individual, and puts the will to energize in a stronger condition for the next "stunt," whether it be on the flying rings or probably in such a remoter field as arithmetic; and finally builds up the basic neurological combinations on which the very intelligence itself rests. The best types of dancing require as much co-ordination as any form of gymnastics in existence. This is believed to be one of the reasons for the success of that education which was undoubtedly one of the main factors in producing that most brilliant epoch that the world has ever seen, ancient Greece in her glory.

[1] The movements of the Shakers or Quakers had the instinct for rhythm as their basis. Our universal love of music and periodic sentences is another example.

By the Greeks dancing was regarded as one of the fundamentals in education. It was not merely that the strength, grace, and endurance of the body were trained by these dances, but that the nervous and mental bases for straight and wholesome thinking were thus laid—that neurological basis upon which co-operation of mind and body rests.

One may ask whether it is not possible to get all these benefits with other forms of gymnastics? No, it is not. To begin with, under the conditions of limited space which all physical instructors have to face, there is more all-round physical exercise in certain forms of dancing than in any known form of gymnastics, or probably than in any game. This makes it essential at times, even if we do not consider its appeal to fundamental social and psychological needs of the organism.

Again, any one with any experience as a teacher, or any one who has tried to get exercise by himself, knows that nothing makes the same appeal or renders the same enjoyment that a game does, *and folk-dancing is a game set to music.* Exercise without enjoyment is like meat without salt. It may sustain life but who wishes merely to exist?

Types of Dances.—Of course, there are any number of kinds of dances. They divide, however, into three main groups—*esthetic dancing*, closely allied to the old Greek dance, the *folk-dance*, and the *social dance.* There are transitional dances lying between these groups. The esthetic type is most beautiful, graceful, and beneficial, and also most difficult; the folk-dance is occupational in type, often beautiful, most rhythmical, and most joyous; the social is anything that the performers make it. The first two are excellent from the physical standpoint, the last much less so, not including, of course, the good old contra or square dances, which are really folk-dances.

Almost all countries have folk-dances that are peculiar to themselves. In the United States, I suppose, the only truly indigenous folk-dances are the Indian dances, which are occu-

pational and symbolic, and in their original form were largely religious ceremonies. There have been some folk-dances brought here. The old contra-dance seen in rural New England and the other older parts of the country has practically become our folk-dance; and the moral distinction between it and the "round dance" is sharply drawn by some communities.

For school work the most beneficial type is the folk-dances, both because they enable all to get exercise at the same time in a limited space, and because they are in themselves a graded course, graded both as to the amount of exertion required and as to the difficulty of accomplishment.

These folk-dances, more than any other type, rehearse the life history of the race: combat, the chase, sowing and reaping, and the trades. Representing, as they do, the racially old neurological co-ordinations, they will help to give the child the race inheritance upon which honest thinking and wholesome feeling rest. Properly taught, dancing will tend to develop not only clean, straight thinking, but wholesome, normal feeling. Being so fundamental, the original tendencies underlying dancing are bound to find expression. Why not guide this expression into definite educative channels? Dances should be taught not only as a part of the muscular education, but as a part of the emotional and cultural education. In schools a talking-machine and movable school desk-chairs, such as the Mouthrop and others, or even low tables and separate chairs, make possible a clearing of the classroom floor for group games and dancing. If the community is prejudiced against the word dance, such terms as musical games, rhythmic exercises, rhythmic gymnastics, folk-games, etc., may be used. In such cases nothing approximating the social dances to which the community is opposed should be introduced.

Do not conclude that the writer believes that dancing is a complete system of physical education in itself. He does not. It has, for example, little corrective effect on the de-

formities caused by improper school seats and desks, but that it is a very valuable adjunct and that it is an essential part in any rational system of physical training is no longer open to question.

Team-Games and Athletics.—The next step, and one increasing in importance with age, is the more highly organized games and athletics. These are competitive in their general appeal and have a most excellent effect, aside from their marked physical benefits, on the spirit of co-operation and loyalty. The boy who develops a large loyalty to his team will very probably tend to be loyal also to his school, to his family, and to his community. Such activities divert the "gang" spirit to some good purpose. They also tend to inculcate courtesy, honor, and respect for law, and, owing to the self-restraint which a mild degree of training demands, are large builders of self-control and of clean living.

The upbuilding of sportsmanship, which is a combination of self-control, honor, and courtesy, is a most important function of these games and of the student gatherings which accompany them. Too many of our school games are used merely as excuses for rowdyism, and it is an interesting fact that this rowdyism is rarely participated in by the players, but is led and incited by the cigarette-smoking good-for-nothings on the bleachers, who roll up their trousers instead of their sleeves, and go into hysteria instead of the game.

These most highly organized games require lightning-like thinking and instant decision. Here, truly, "he who hesitates is lost," and the playing of these undoubtedly makes to a certain degree and in certain directions for decision of character.

Work on Apparatus.—The last group of which I shall speak is the purely gymnastic or "apparatus" work, which, combined with the other groups, is most advantageous in building up grace, co-ordination, power, and self-confidence. It is very essential to the building-up of the sense of equilibrium of the body in motion. There is danger, however, of

A gymnasium of the Public Parks of Chicago. Why not in every public school?

overdoing this branch with young pupils, as too great use of any one type of apparatus, especially the parallel bars, leads to overdevelopment of certain parts of the body at the expense of the others, and may result in deformity.

Time Allotment.—In high schools the usual method is to have two forty or fifty minute periods a week for every student. Gymnastics should be required of all, as it is in the grades, and credit should be given for the work. Only those who do good work in the gymnasium and in their studies should be allowed to represent their school in games and athletics.

In those elementary schools having gymnasiums there should be at least two thirty-minute periods a week, and there should be a large preponderance of games, free-hand gymnastics, marching, etc., not more than one-fifth of the time being devoted to apparatus work.

VII. Playgrounds and Gardens.—There should go with all this school work a well-thought-out system of equipped school playgrounds and school gardens. As a preliminary to fitting pupils for equipped playground work, the organized recess is a great help, and, in fact, in any large school with a crowded school yard it is essential if we are to get any real value out of the recess. At present most of the children merely stand about, collect in groups to malign the teacher, to tell stories of a vile or indifferent nature, to chase one another about and play uneducative games, or to fight. The organized recess, that is, the division of the yard into areas for each grade, the appointment of play leaders, and the detailing of a few teachers to supervise, does away with the undesirable features of the unsupervised recess. Moreover, getting out of doors does the teacher as much good as it does the pupil. For her own health and happiness, if not for extending her educational services, all teachers should cultivate the habit of play participation and leadership at recess and other times.

The discussion of playground and school-garden work is

too long to take up here. I speak of it merely to insist that it should be under the same supervising head as is the other physical-training work. Rural teachers will get many valuable suggestions in Curtis's "Play and Recreation for the Open Country."

Every teacher, principal, and superintendent should be promoters of such activities as the Boy Scouts and Camp-Fire Girls. Each of these promotes a type of preparedness which for the boys is as vitally educative for peace as for war, without being directed toward the latter, and for girls promotes the best ideals and capacities of American womanhood.

We must also remember that we cannot build the body without building the mind and that, other things being anywhere near equal, the strong, well child is much more likely to become the good student and the clean-living, upright adult than is the weakling. It is our duty as educators, therefore, to see that we give training so diversified that, combined with their other mental and moral training, we may turn out complete, perfect products—true, efficient, and honorable American men and women.

SUMMARY

1. Changing social conditions which have resulted in removing the probabilities of proper play and proper physical experiences have made it necessary to give these through the school.
2. Long confinement in improper school furniture has made it doubly necessary to give active exercise to the big, fundamental muscles.
3. At certain ages, fundamental instincts arising compel certain activities in the child, which make necessary a progression in physical education corresponding in time to these instincts.
4. A knowledge of the rich past of physical education, extending from the days of Greece to our own time, is necessary for the proper teaching of it.
5. The principles of physical education demand in its content interest, rhythm, thinking, and vigor, with resulting proper posture; as well as many situations which cultivate obedience,

honor, courtesy, and loyalty, which shall build up the moral side of the individual.

6. In practice the work must be graded; it must be handled where there is plenty of fresh air; it must have variety, including marching, formal gymnastics, apparatus work, folk-dancing, games, and athletics.
7. Marching is peculiarly adapted to teaching obedience, quick thinking, and proper carriage, although these may not be entirely general acquisitions.
8. Formal gymnastics should include not only calisthenics, use of dumb-bells, wands, etc., but should be made occupational in type whenever possible.
9. Because games and plays are being lost, it has become necessary for adults to teach children how to play.
10. Folk-dances, because they are rhythmical, physiological, co-operative, recreational, and have progression, are one of the most important phases of physical education.
11. Any well-designed system of physical education should include not only all the foregoing, but also playgrounds, manual training, school gardens, and other motor occupations.
12. The duty of the school to turn out complete, perfect products, may be fulfilled only by training the body and soul as well as the mind.

PROJECTS IN APPLICATION

1. Under what conditions as regards clothing, space, and air should physical education be carried on?
2. What minimum of time weekly should be devoted to this work?
3. Why are games essential?
4. What is the value of folk-dancing?
5. What methods would you use and on what phases of physical education would you put most emphasis to get correct posture?
6. Compare the ideals of physical education at Athens and at Sparta.
7. What has been the relation between the decadence of great nations and their attitude toward physical education?
8. How is our growing appreciation of the value of child welfare being evidenced?
9. How would you control the responses of your pupils by the rhythm and inflection of the voice?
10. How would you organize your school so as to get the most out of the play space and equipment available?

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CHAPTER XX

HISTORY

Preliminary Problems

1. Find out what kind of historical facts the pupil most easily remembers.
2. Does the pupil voluntarily use historical reasons for things now existing?
3. How does the pupil think of relationships implying lapse of time?
4. Is the pupil able to see the other side when the United States is involved in a controversy?
5. What American or European heroes or characters has the pupil become familiar with before the formal study of history?
6. What is the pupil's attitude toward Europe and the particular countries of Europe?
7. Do the younger pupils enjoy dramatizing famous historical scenes?
8. Does the pupil use a knowledge of geography in studying events in which the geographical situation is an important factor?
9. Does the pupil know how to draw maps?
10. Does the pupil voluntarily read historical accounts or stories?

The Aim.—Good teaching of history should enable the pupil to understand more fully the community of which he is a member, and to appreciate with increasing clearness his relations to it. This constitutes the claim of the subject to an important place in the curriculum of the common schools. Such a claim could be based upon the fact that interest in the personages and events of the past is as ancient as human society, and that history is one of the most characteristic forms of all literatures. Nevertheless, the value of a subject for the instruction and satisfaction of men and women might be undoubted while its usefulness in the education of children remained obscure. The relish of the child for historical tales is hardly a sufficient reason.

History as a Mode of Explanation.—Historical knowledge is often spoken of as if it were hardly more than a polite accomplishment, furnishing the means of recognizing references met in conversation or in reading. It is needless to argue that such a view is superficial. The best explanation of a law, an institution, a custom, or a belief is frequently its history. Nearly everything characteristic of the community, be this large or small, city, state, or nation, is a growth, a structure. Each generation has added to the whole for better or worse. The result is incomprehensible without some account, that is, a history, of the changes, the reasons for them, and the way they were made.

The service of history as a method of explanation is more obvious in some cases than in others. For example, an account of elections which should say nothing of the reasons drawn from experience, that is, from history, for the change from nomination by convention to direct nominations would not be very enlightening. Again, who would venture to explain without the aid of history the varieties of religious belief and practice in the United States? The same is true of industrial facts. Descriptive geography may explain partially the importance of a city like Chicago, but the explanation will become clearer and fuller when the history of the city is given, showing how it was affected by the building of railroads, the development of water-routes, the movement of population, and the changes in the methods of industry.

Information.—In seeking to show that the study of history is vital to any adequate comprehension of the essential features of our modern American life, it is not intended to ignore or belittle the value of mere historical information. There are many facts of which the intelligent man or woman is obliged sooner or later to take account that are purely historical and can be acquired only by a study or reading of history. Where but to history are we to turn for the facts which lie behind the race question in the South, for the meaning of the phrase "Solid South," for the interpretation of the

Monroe Doctrine, the possession of the Philippine Islands and Porto Rico, the make-up of our population, the origin of trusts and labor organizations, and a host of other conditions? In some of these cases even a little knowledge of history would serve as a corrective of much superficial and prejudiced opinion, which at times becomes dangerous in a democracy with new direct and rapid modes of action.

Moral Value of History.—From an understanding of the part others have taken in making the community what it is, the pupil inevitably comes to a clearer appreciation of his relation to it. Knowledge does not make every one wise or public-spirited or patriotic, but it quickens the sense of responsibility in those who have the right disposition. If a boy once follows the history of a law providing for the compensation of workmen injured in accidents, for regulating the hours of labor, or for controlling the employment of women and children—laws which may affect vitally the members of his own family—he is likely to acquire a more intelligent sense of his future duties as a citizen in regard to legislation. The history of a city, rather than its statistics of population, trade, and wealth, will tend to awaken true civic pride and loyalty. The long story of industry, of invention, of the efforts to better the conditions under which work is done, of the increasing interdependence of industries, those of the nation and of the world, as well as those of a particular locality, should make work more interesting, quicken the spirit of co-operation, and render more reasonable the attitude of those on different sides of industrial questions. If we rise to higher conceptions still, we may ask: How can a boy or girl remain devoid of love of country when once taught the story of the adventurous spirits who discovered and explored it, of the many sacrifices made to defend it, and of the great men and women whom it has produced?

Mental Training.—Work in history has other values for the pupil. It trains the historical imagination. Using the materials made familiar by the child's ordinary associations

of the home, the street, the church, and of civic life, history builds up pictures and images of many situations, political, social, or religious, giving the child power vividly to realize more and more what the world is and to see what it has been. Through stories of great men and women, history enriches the child's conceptions of character. The social judgment is also trained. Contact, even in the brief paragraphs of the text-book or through the words of the teacher, with many actual problems of conduct or policy, leaves impressions or invites opinions. Such activities of the mind also have a moral value, for they prepare the growing youth to make wiser choices as the practical problems of his community confront him. As an incident to the presentation of the many situations which make up the history of our own or other peoples, the pupil is necessarily taught to organize facts, to perceive their relative importance, to study them in a correct perspective. These statements suggest only a few of the ways in which historical study may serve in training the child's mind in valuable specific connections.

A Formative Influence.—Success in teaching history is only partial until the pupil's original interest in the varied experiences of the past becomes so strong that it will continue to act as a formative influence in his intellectual growth. The realization of such an ideal will be more certain if he is taught some use of books and if his taste for reading is encouraged to include historical books adapted to his years.

The Course of Study.—The place of history in the curriculum is not finally determined. The present tendency is to have it represented in every grade. In the early grades the work commonly suggested is pictures from history or historical types rather than history; for the idea of sequence in time, or chronological development, which is essential to history, is necessarily absent. The use of historical material, however, enriches the beginner's imagination and furnishes his mind with words and images which will become its tools in later work.

The debatable land in the course is found in the work for the fourth, fifth, and sixth grades. The question for these grades is affected by the increasing demand for more attention in programs to the European background of American history and civilization. Thoughtful persons are beginning to realize that the child who is taught only what has happened on American soil will gain a very inadequate idea of American civilization, which is, in its origin, chiefly European. The older conception of American history was provincial, and was calculated to produce provincial minds. The problem is how and where is this related European history to be inserted? The answer is rendered difficult by the fact that a great many school children leave school as soon as the laws permit them to work as regular employees. These children do not advance ordinarily beyond the fifth grade. If the thorough study of American history is reserved for the seventh and eighth grades—which is the usual and reasonable practice—it would seem necessary to insert a previous and simpler treatment for the sake of the pupils who leave early.

The Committee of Eight of the American Historical Association has attempted to solve the problem by devoting the fourth and fifth years to the study of leading characters and typical scenes taken from the Colonial and national periods. This is to be followed in the sixth grade by the study of events, arts, and customs, selected from Greek, Roman, and mediæval life, which explain the civilization carried by the Colonial emigrants to America. To such material about two-thirds of the sixth year are to be devoted, while the remainder is to be reserved for topics from the history of discovery and exploration, with the attendant European rivalries, as far as the year 1600. This plan has been criticised as overloading the sixth year, but the criticism has usually been based on the mistaken notion that the plan calls for the systematic treatment of ancient and mediæval history, instead of the study of typical features of these periods. In Indiana the attempt has been made to avoid the danger of

Pasted picture of Pueblo village in Montclair, N. J., schools

overloading the sixth grade by using in the third and fourth years many stories from the history of Greece and Rome. The Indiana course for the sixth grade is based upon English, instead of general European, history. In a curriculum published in 1908 by Teachers College, Columbia University, there is a fuller treatment of Greek, Roman, and mediæval history, covering about a year and a half, placed between the study of American typical characters and the fuller consideration of American history at the close of the course.

Subject Matter: Grades 1 to 3.—The subject matter for the first two grades, and to some extent for the third grade, is drawn commonly from primitive life, especially from that of the American Indians. Certain plans take their guiding thought from the sequence in epochs of culture, giving to the pupils of the first grade problems of food and clothing, to those of the second grade pastoral and agricultural life, and to those of the third the beginnings of trade, travel, and discovery. In the Teachers College course this leads in turn to the study of local history, the discoveries of Henry Hudson, and the Dutch settlement on Manhattan Island. The same idea is worked out in the course prepared for the Elementary School of the University of Chicago.

The successful use of any of these plans calls for a right choice of material and skilful methods of presentation. It is evident that the work must be oral and that it should be supplemented by simple tasks of construction assigned to the pupils. The teacher's first care is the selection of stories. Of these many lists exist. In a "Bibliography of History," by Andrews, Gambrill, and Tall, published under the auspices of the Association of History Teachers of the Middle States and Maryland, many books are mentioned, and their usefulness or adaptability to the needs of the several grades is stated. The opinions are based upon actual use by teachers. Other lists will be found in the "Report of the Committee of Eight," in Talkington's "How to Teach History and Civics in the Grades," and in McMurry's "Special Method in His-

tory." The teacher's next task is to learn how to tell such stories, unless she has already received the necessary training in normal schools or in the training-schools connected with the libraries of the larger cities. By study of the best printed stories and by practice, noting the methods which hold the attention of the children, the teacher may solve the problem for herself. Suggestions on method may be found in McMurry, Talkington, and especially in Sara Cone Bryant's "How to Tell Stories to Children."

The story should be interrupted or supplemented by questions framed in such a way that the pupils will be led to work out for themselves the problems which it presents. If, for example, they are studying pastoral life, they may be asked such questions as the following: "Will these men be likely to choose a warm or a cold country? A moist or a dry one? Will they need for their flocks forests or open land? How long will they be likely to remain in one place? What kind of a house will it be wise for them to build, one like ours, or one like the nomadic hunter? How will they care for the sheep in stormy weather?"[1] As the pupils are naturally active with their hands, their work may be accompanied by tasks of construction. The Committee of Eight suggests the construction in the first grade of an Indian wigwam on a sand-table moulded to present the arrangements of Indian home life.

In the third grade the Committee of Eight suggests as a part of the work, stories of the "Heroes of Other Times," as Moses, Ulysses, Alexander, Cincinnatus, Tell, Alfred, and Joan of Arc. The Indiana course emphasizes tales from Hebrew life, reserving two-thirds of the time for tales from Greece. Other courses use Phœnician traders and discoverers, or the vikings.

Much use is made in these grades of national and local anniversaries—Thanksgiving Day, Washington's Birthday, Memorial Day, Independence Day, Columbus Day, etc.

[1] "Elementary School Curriculum," p. 124.

This offers the opportunity to make the children familiar with a few outstanding features of American history.[1] Care should be taken, however, that as the anniversaries recur the same stories be not repeated too many times, for that is a sure method of wearying the pupils of the very names and ideas they should be taught to honor.

Grades 4 and 5.—Whether typical scenes and persons from American history be given in the fourth and fifth grades or only in the fifth grade, the teacher should be cautioned not to attempt to cover too much ground. Many leading characters must be omitted, in order that those included may be treated with detail sufficient to leave upon the pupil's mind a distinct and permanent impression. The list may well be varied according to the location of the school. For example, it would be impossible to omit Ponce de Leon in Florida, but his career is less important for the child of the Northwest. Coronado should be particularly interesting to children of the Southwest, but not so much to children of New England. The remote is difficult for the child to picture, unless the remoteness is merely geographical. The story may be very close to the child's interest because of his love of the marvellous. Ponce de Leon's search for the Fountain of Youth may, accordingly, be of value to any child without regard to locality. Heroes of peace and industry, like Franklin, Whitney, Fulton, Clinton, should be as prominent in the list as heroes of war on sea or land. In dealing with any character chosen the first effort should be to awaken in the child's mind a sympathetic interest. Facts drawn from the boyhood of such persons will serve this purpose. The child finds it difficult to put himself in the place of a grown person, while he is powerfully affected by the experiences of one as young as himself.

Part of the time in these grades should be devoted to typical scenes and situations from American history: An early

[1] The much used book for teachers entitled "Jean Mitchell's School" is largely made up of the story of how a teacher utilized special days of this kind.

settlement on the coast, a fur-trader's station on the frontier, Colonial industry, a settlement beyond the mountains in Kentucky or Ohio, a plantation in the South, a mining-camp, a cattle-ranch, or a wheat farm in the West. The list, as in the case of persons, should depend somewhat on the locality.

Persons and scenes should frequently be treated according to the method of the type lesson. This is a complete study of a single topic in a way adapted to the needs of the children of a particular grade. The impressions which the pupil receives from the vividness of these intensive and detailed studies of typical events, instead of from a vague treatment of the whole story, will be carried over to other similar topics in the list, which may then be treated more briefly. These type lessons should follow one another, so far as possible, in chronological order, that the pupil may be led unconsciously to begin the construction of his framework of American history. His historical knowledge, elementary as it is, should not be merely a string of edifying anecdotes.

Sixth Grade.—In planning the work of the sixth grade, if it is to include the European background, based either upon European history or mainly upon English history, topics and facts should be selected for their bearing upon the development of America, that is, upon the history of the United States. The advantage of choosing general European history is that this plan makes possible a more just presentation of what the peoples of the Continent, as well as the English, have contributed to our growth. It facilitates also the acquisition of a view of the way in which the civilized world has been enlarged, or moved, from its ancient seats on the banks of the Nile, the Euphrates, and the Tigris, or on the shores of the Mediterranean. Two formative ideas are to be kept in mind: the rise of the arts and customs which constitute one essential element of our civilization and the direction which the geographical extension of civilized mankind has taken. The latter idea permits close correlation between geographical and historical facts.

In such a course there can be no attempt to teach the full history of any people, either Greek, Roman, or English. The task is to explain how the Greeks or the Romans, the English, Germans, French, Spaniards, or the Italians became our teachers in arts, customs, beliefs, and in ways of government. The study of formal ancient, medieval, or English history should be preserved for the secondary school.

The method of presenting the material for the sixth grade, and even for the fifth, should be based upon the use of the text-book. Care in the selection of topics is vital to success, and the average teacher, without the advantage of large collections of books or the leisure to use them, cannot be expected to "get up" the topics. She may well plan to supplement the matter which is necessarily presented in very brief form in the text-book.

Seventh and Eighth Grades: Principal Topics.—The selection of matter for the final treatment of American history in the elementary school is not a closed question as soon as a particular text-book is chosen. Text-books were once made under the impression that the principal aim of the history course was to produce politicians, constitutional lawyers, or military commanders. The tradition still lingers in some quarters. The teacher who is in sympathy with the "New History," which is at least as old as Guizot, should emphasize the sections on industrial and social history. This may be done both by giving needed explanations in detail, by adding such other material as she or her pupils can find in reference books, and by laying little stress on, or omitting, less important topics, remembering that the aim is to help the children to an understanding and appreciation of the world to-day as they need to know it. The teacher's desk or the school library should be provided with such books as Bogart's or Coman's "Industrial History of the United States," Brigham's or Semple's books on "Geographic Influences in American History," and Sparks's "Expansion of the American People."

Characteristic Movements.—There are certain characteristic movements which should guide the teacher in placing the emphasis and in supplementing the material furnished by the text-book. One of the most important is emigration from Europe, both in the Colonial and in the national periods; its causes, ways and means, and results in settlement. From this study it will appear that even in the seventeenth and eighteenth centuries the American population had several important elements besides the English, namely, Scotch-Irish, German, Dutch, and French. Another great topic is the westward movement: Routes, location of settlements, occupations adopted, cities, and their spheres of influence, and development of means of communication. Still another topic is the change from household industries to the factory system. It is also necessary to follow carefully the development of the plantation system in its relation to slavery, especially after the invention of the cotton-gin seemed to be making cotton "king." The renewal of the South after the war and the rapid development of the Far West should be made prominent during the latter part of the course. These are not topics to be treated once or twice, but are to be kept constantly in mind as long-continued processes, furnishing points of view from which to organize much of the work.

Relations of History and Geography.—Geography and chronology have been called the two eyes of history. Some theorists believe that history can dispense with one of them, declaring that "Freed from chronology, the near and the remote may become equally potent in the life of the child." Teachers occasionally make the contrary mistake and resolve history into lists of names and dates. The commonest error, however, is to fail in appreciating the close relations between history and geography. It is not enough to require the pupils to locate on the map places mentioned in the text, or to see that they become familiar with changing boundary-lines and territorial extensions—they must be taught to view historical movements in their geographical setting. Two or three illustrations will show how this may be accomplished.

Geography and the Occupation of the Mississippi Valley.—In order to understand the struggle of the French and the English for the Mississippi Valley, the pupil must first study the Appalachian barrier and the passes by which it may be penetrated. He will then realize the advantage which the French gained by the founding of Quebec and Montreal and the discovery of the upper lakes. The consequence was that Father Marquette reached the Mississippi River within two years after the Virginians had with difficulty made their way over the Blue Ridge as far as the headwaters of the Kanawha. At the southern end of the Mississippi Valley the French occupation under Iberville barely anticipated the seizure of the country by Englishmen from the Carolinas. Meanwhile the English had begun their encroachments on the north from the Hudson Bay country and, more directly, at the mouth of the St. Lawrence. Such a struggle becomes far clearer in its geographical setting than if its chronology alone serves as a means of organizing details.

Westward Movement.—The method is equally useful in presenting the westward movement in the nineteenth century, when natural features were being modified by the construction of canals and the use of steamboats upon the waterways of the interior as well as later by the building of railroads.

Study of Wars.—In teaching the history of the important wars the geographical setting should be used, treating chronology as secondary. For example, in the Revolutionary War the position of the Colonial armies between the coast and the mountains, the possession of the sea as a base by the British, with incursions inland as characteristic incidents, are vital elements in the presentation, and if properly handled will make the struggle more intelligible to the pupils. The loss of the sea-base in the Yorktown campaign was fatal to the British cause.

Civil War.—Soon after the Civil War opened the North had secure control of the sea as a base of operations against any part of the long coast-line of the Confederacy. On the land side there were two theatres of conflict, one east of the

Appalachian barrier, the other west. A study of the early Confederate lines of defense in the West reveals the use made of the high bluffs on the Mississippi, of navigable waterways like the Tennessee and the Cumberland, of railroad centres like Bowling Green and Corinth, and of mountain gaps. Similar illustrations may be found in the geographical features of Virginia. It is far clearer to set the facts in such a geographical framework than to group them only by campaigns or by years.

Management of Work: Plans.—The teacher should, before the opening of the term, make out a detailed plan, with lesson assignments including the minor topics to be emphasized during the lesson, and even the more important questions which may be asked. The lessons may be grouped under the head of larger topics, as "Colonial Immigration," or the "Westward Movement," or the "Slavery Conflict." Some teachers place in vertical columns the subject matter of a term's work, divided horizontally into the approximate portions which are to be covered. When history and geography are placed together, evident correlations may be utilized. The aim is not to construct a rigid scheme, but only a working plan, subject to modifications as the lessons proceed. Without it the management of the work will frequently be left to the chance suggestions of overcrowded hours.[1]

Graded Work.—As the work should include, besides the mastery of the text-book, other tasks: for example, type lessons, map-making, studies from pictures, readings, comparisons, summaries of long-continued movements, reviews of periods, etc., these should appear in the plan in their appropriate position. Several of them imply training and should be graded from the more simple to the more complex and difficult. Their place in the plan should be studied carefully, in order that the interest of the pupil may be stimulated and that he may become conscious that the study of

[1] See also the plans given in Strayer's "The Teaching Process."

history will give him increase in intelligent skill as well as stores of information. For example, the exercises in the construction of maps should be graded, like lessons in drawing. The utilization of pictures is another illustration. A sufficient interval of time should separate one exercise from another of the same kind to avoid monotony.

Lesson Assignments.—Some teachers spend a part, even half, of the recitation period in preparing the pupils to learn the next lesson. They give them an outline on leading questions, or go over the paragraphs in detail in order to teach the pupils how to study. Here again a method which may be necessary in the early stages of the work must be modified later. The pupil should gain the power to organize and master material with which he is unfamiliar. He should not get the notion that the work is to be done for him. Probably at no time in the course can he be left solely to his own initiative, but the amount and nature of the suggestions should be changed as his capacity develops. The amount varies also with the nature of the material of the particular lesson. In some cases this material is all narrative or it is on the same topic and is of simple character, while in other cases the text seems to be a collection of names and places, set in unfamiliar circumstances, and the child's imagination is pulled and hauled about until it is hopelessly bewildered.

Text-Book.—The first care of the teacher is that the pupils understand how to read the text-book. She should be on the watch for words, phrases, and general statements above the mental level of the class. The pupils should be encouraged to discover these and point them out. Text-books often contain generalizations, dictated by the need of brevity, which are mere *words* to the pupil unacquainted with the details upon which the statement is based. Moreover, the act of generalization is largely beyond his capacity in this field. The teacher must, accordingly, be ready to substitute simple, illustrative details. By constantly insisting that the text-book shall be understood and by help-

fully guiding his study, the teacher is assisting the pupil to form the habit of alert reading. The length of the text-book assignment cannot be fixed arbitrarily, for at a particular stage of the work a good plan may call for other tasks, a map, perhaps, or a type lesson.[1]

Outlines.—The making of a lesson outline may have a double value; it gives the pupil a better understanding of the subject matter, and it trains his mind in the orderly arrangement of facts. It is a task which he must be taught, and one which, as he proceeds, may well call for greater skill in thoughtful analysis. The teacher may furnish the outlines at first, but soon she should require the pupils to assist her or to make them alone. If made by the pupil, they should be copied in his note-book, and the best one or two written on the blackboard. After the pupils have learned to make outlines some other task should be substituted, in order to avoid the danger that such work may become mechanical and dull. Pupils frequently save themselves the labor of real analysis by using in their outline the paragraph headings in the text-book. Instead of the outline, lists of questions or one or two problems may be assigned. The pupils may also be asked to suggest questions for which the statements in the text-book furnish no answer. The problem method of teaching history, or the large use of definite problems, aids in developing a thoughtful attitude toward social movements. Still other substitutes for the outline of the individual lesson are outlines of a movement which has been the leading topic for several lessons, or summaries of the characteristics of some party, or section of the country, or period. Variety and progress in the nature of the work are essential.

Questioning.—The principal work of the recitation hour will be done through the question and answer. The teacher should not lecture to pupils in the elementary grades. Explanations may be given, facts may be added to those stated

[1] See McMurry's "How to Study, and Teaching Children How to Study," and Dewey's "How We Think."

in the text-book, and illustrative incidents told, but these should play a subordinate part. The teacher should therefore study thoughtfully the art of questioning.

Two Cases.—The question may have one of two principal aims. On the one hand, it may call for an answer presenting information contained in the text-book and in reference reading, or, on the other hand, it may provoke thought upon the relation of one fact in the lesson to another. In the first case, the question should usually be so framed as to require a complete answer; it should not permit the pupil to give mere fragments of statement. It should therefore seize the heart of the matter. Pupils easily slip into the habit of answering with scraps of sentences, throwing upon the teacher the responsibility of drawing out other bits of information by further questioning. If the work in history is not to undo the work in English, such answers must not be tolerated. Sometimes the pupil is unable to organize the facts, because he has not learned how to study and to think. In such cases the teacher is justified in changing the form of the questions so that the power of orderly presentation may be developed. Undeveloped power should, however, not be confused with mental inertness. The teacher should remember that there are others in the class, and that by lingering too long over individual difficulties the life of the class may be destroyed. It is better, for the most part, to deal with such cases privately.

As questions, or problems, of the second kind call for thought in directions which the text-book does not always point out, the teacher should expect to guide the pupil's mind, unless the relation of facts is simple or the problem readily solved. Suppose, for example, that the general topic is the Revolutionary War and the class is considering the cry of the colonists against "taxation without representation." The teacher might ask the rather hard question: "Why was the British retort that the colonists were represented as much as the people of Birmingham and Manchester not satisfac-

tory?" The pupils would need guidance to see that they must first learn whether the colonists and the British officials had the same idea of representation, and that this could be found by comparing the system of representation in Massachusetts with that in England. Another problem which would have to be separated into its elements would be: "Were the good people of New England justified in smuggling sugar and molasses from the French West Indies?"

Maps.—The schoolroom should be furnished with a set of historical wall maps and with an historical atlas to supplement the maps contained in the text-book. All should be utilized as material for answers to simple problems in historical geography. In dealing with the discoveries and early explorations the maps made at that time should be utilized. Copies of these will be found in the text-book or in historical reference books and atlases. The difficulties of De Soto, Coronado, and La Salle are inconceivable from a modern map.

The work should include the construction of maps, ordinarily with the use of printed outlines of which many kinds exist. The pupils will not learn a map merely from looking at one, they will master its principal features only by reproducing them. Their most common task, however, should be working out special geographical situations. Historical maps are usually designed to illustrate the movements of a whole period, and are covered with names which have no bearing upon the situation under consideration. In studying the westward movement, for example, the pupil may be asked to mark on an outline map the principal roads and canals in existence in 1825, and, again, the earliest western railroads. The class should be taught both drawing in colors and drawing in black and white. Neatness, accuracy, and good taste should be required.

Pictures.—It is not enough to use pictures to stimulate the pupil's interest in persons and places; they should, like maps, be treated as material for systematic study. This implies the existence of a collection sufficiently extensive to

illustrate many phases of the subject. For example—to take the westward movement again—its understanding would be facilitated if the teacher could show photographs or postal-card reproductions of the St. Lawrence River, the Lachine Rapids, the Mohawk Valley, Wills Creek, the passes in the Blue Ridge, the upper Tennessee, and Cumberland Gap. In the same way, for the study of the modes of emigration, much use could be made of a set of pictures on the development of the ship from the time of the Venetians to the days of the *Vaterland* and the *Aquitania*, or later. Pictures are needed, also, as aids to a comprehension of the economic life of the country, its plantations, its western farms, its railroad centres and great canals. For the study of such topics, questions should be prepared the answers to which could be worked out from the pictures by the pupils.[1]

Reading.—In selecting books or passages in books for the pupils to read care should be taken that the descriptions or the narrative touch facts within the circle of the pupil's interest and are presented in a simple form. In the case of books like Hart's "Source Readers" this has been done already by the editor. Books by able historians are not often adapted to the purpose, being addressed to mature men and women. The story must predominate. Biography is the most serviceable. It is not enough to find a book on a recommended list; the teacher should personally see if it is adapted to the needs of her particular group.

Note-Books.—In the elementary school the note-book should be used only as the collected form of the exercises assigned to the children during the term. It should contain the assignment of lessons, the outlines given by the teacher or made under her direction, summaries, and maps. In it may well be kept the original of each examination-paper written by the pupil, with the teacher's corrections. If the teacher gives from time to time important facts not con-

[1] A list of firms publishing pictures and postal cards may be found in the *History Teachers' Magazine* for June, 1913.

tained in the text-book, these may be entered in the note-book from the teacher's dictation. The pupils should not be expected to take notes from oral explanations given in any other way. Above all, no mere task work should appear in the note-books; indeed, no such work should be required.

SUMMARY

1. History enables the pupil to understand more fully the community of which he is a member.
2. History quickens local pride and national patriotism, by showing that men and women of past generations have contributed to the growth both of the individual community and of the whole country.
3. The course in history should be continuous and its parts should be carefully correlated.
4. For the earlier grades the material should be concrete—facts within the range of the pupil's experience and presented in the form of story or simple description.
5. The work of the last three grades should open with stories, descriptions, and explanations chosen from the European background, that is, from the beginnings in Europe of customs and ways of living which we use in America.
6. Industrial and social facts should not be crowded out by the story of politics, wars, and governmental institutions.
7. In presenting historical facts the geographical setting should be more frequently and intelligently used.
8. The term's work should be carefully planned, in order that the pupils may not merely accumulate facts but gain in ability to comprehend historical situations and to distinguish between the true and the false.
9. In the methods employed variety and progress are essential.
10. The teacher should select collateral reading, with a view to the needs and capacity of the pupil. Only carefully sifted lists should be relied upon.

PROJECTS IN APPLICATION

1. Find the history of some local custom or institution.
2. Learn what customs, beliefs, and institutions the original settlers had.
3. Learn the story of the invention most useful in the particular community.

4. Is Lincoln regarded in the same way by the children of the South and the North?
5. What buildings in the town or city have a Greek façade; what churches are Romanesque or Gothic?
6. To what extent is the nearest river used for transportation?
7. What is the nearest range of mountains and the nearest pass?
8. What important events in the history of the United States happened within a hundred miles of the community?
9. Which pupil can find the largest number of words or phrases in the next lesson which are not understood?
10. Which pupil can ask the best question implying a relation between a fact of the lesson and a fact in a lesson studied at least two weeks before?

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CHAPTER XXI

CIVICS

Preliminary Problems

1. Whom do you regard as the most efficient citizens of your community? How did they gain their civic power? What did schools contribute?
2. Is it true that in a democracy every intelligent and able-bodied person has both public and private duties? Is this true for women as well as men?
3. In what ways is citizenship manifested? What are the marks of a good citizen?
4. Is there any public co-operative work in the way of improving the schools, eliminating saloons, getting pure water, improved streets, better roads, abler public officials, or improved community recreation, that is not being done in your community? Why isn't it?
5. What is the proportion of young women to young men who are getting a high-school and college education in your state? Do educated women have more or less leisure for civic leadership than educated men to-day?
6. What civic questions should be discussed by the people of your community? Where may they best meet for such discussion? Who should lead and suggest such public meetings?
7. In what ways have you learned about civic opportunities and responsibilities? May a person know a great deal about civic needs and how to meet them and not do anything? Why?
8. What stories or biographies can children read that will inspire them with right ideals of citizenship?
9. How can we get children to act out, to live, and make habitual good citizenship?
10. What is the relative value of time spent on community civics and on apothecaries' weight and other similar phases of arithmetic?

I. The Problem of Civic Education

Civic Efficiency is one of the five great aims of education. The nation that grows weak and uninterested civically is

doomed to decay or revolution. The democracy which does not educate for vigorous and intelligent citizenship breaks down into a lower type of social organization. The individual who does not gain that education through participation which a democracy affords can attain neither a high type of social efficiency nor self-realization and continued growth. As Aristotle long ago pointed out, a democracy is a highly complex and delicate type of social organization which can succeed only when its educational system trains for democracy. He could not vision the tremendously complex civilization in which we, in the hope of achieving thereby a larger measure and a finer type of individual and social happiness, are trying out the experiment of democratic living. He probably would have considered democracy under our conditions impossible.

Lowell tells us in his lecture on democracy that after the American constitution had been adopted, and the government with its duly elected officers had been started, people quite generally thought they had at last constructed a perpetual-motion machine—a self-active automatism which would run forever without their thought or care. Instead, they had entered upon a new and fragile type of co-operative life in a great continent millions of times larger and more populous than the Greek city-state democracy of old, and in an age when constant change and invention would keep life in an increasing turmoil of complexity and readjustment. They had done away with the king and queen at the top and they had made every man a king and every woman a queen. They had added to the private duties, which every one must bear, a great host of public duties. They had vastly increased the opportunities and possibilities of human life, but they had also greatly increased its dangers and responsibilities. What if people refused to meet their new public duties and went on as before in their pursuit of private gain? What if the rich and powerful should gain control of the government, as in cases where democracy had been attempted in times

Voluntary workers levelling off a "sink hole" between the elementary and high schools of State College, Pa.
Result: better civic spirit and a fine playground

past, and should gradually usurp all rights and privileges and make peasants and serfs of the masses of the people as they did in ancient Rome? What if great immigrant hordes should come to our shores—as they have indeed come—and fail to take up in its fulness and richness the democratic life? What if we should not be able to banish or avoid poverty, injustice, criminality, exploitation of our natural and human resources, preventable death and disease, and the great fears and evils which those who sought these shores and framed our government so fondly hoped they might forever prevent in this virgin land?

The wide-spread failure to realize these hopes Washington, Jefferson, Franklin, and others were kindly not permitted to forevision. Some of them lived to see that nothing less than a universal moulding of human nature along democratic lines would make possible the success of their great experiment. Some of them talked of general schooling of the masses or of special schooling of the leaders. Jefferson founded the University of Virginia; Washington left a large sum, for those days, to found a national university at Washington; Franklin founded what later became the University of Pennsylvania. The Ordinance of the Northwest Territory treated specifically of education, although the Constitution contains no word on the subject, and set aside a section of land in every township with which to foster free schools. "The schools the hope of democracy" finally became a battle-cry and a fixed conviction of many people. From 1820 to 1850 the struggle for free schools was on. In 1828 a man was arrested on the court-house steps of Philadelphia for speaking publicly in favor of free tax-supported public schools. "Rank socialism and paternalism," they said.

"Why should I who have no children be taxed for the schooling of other men's children?" asked one. "Why should I who am already paying for the education of my children in private and parochial schools have to pay still more for the education of those who cannot afford such

schools!" exclaimed another. In Pennsylvania in 1835, a year after the free-school law had been passed, hundreds of lengthy petitions were sent in to the governor and assembly to force the repeal of the obnoxious law; the governor who had helped pass it was thrown out of office at the next election, and it was only through the eloquence of Thaddeus Stevens, backed by many devotees of democracy, far-visioned and disinterested citizens, that the law remained intact. Such was the struggle and the outcome in other states! Full manhood suffrage in all states did not become a reality until about the same time, and woman suffrage is only to-day making every woman a queen in opportunity as well as in responsibility and giving her the education and happiness which can come only from a broad participation in our democratic life. "Education through participation" is as true a motto for grown-ups as it is for children.

The Civic Failure of Schooling.—But the schools have lamentably failed to fulfil the civic functions expected of them by the forefathers. As suggested in our first chapter, the blind cannot well be leaders of the blind, and only civically educated men and women can be expected to furnish, as teachers, the civic education anticipated by our forefathers. The people have largely forgotten this civic function. They have not demanded and paid for men and women of maturity and professional training who would lead their children and their communities toward civic efficiency as an important goal of education. Our teachers, from the kindergarten to the college, have had little direct training or participation in American citizenship; their knowledge of civic affairs is meagre and inadequate, since they have studied other matters; most of them are women, and as such have been denied the prime stimulus of participation and responsibility needed for developing a live interest in civic affairs; and, in general, the teaching body has not yet become effective in promoting adequate American citizenship.

Teachers have, of course, contributed much indirectly.

The ability to read and write and a little knowledge of American history is of value. Some schools have even given some knowledge of the framework of our government in the form of "civics," usually taught in subordination to some other subject, such as history. But this instruction has been of the driest and most non-functioning kind, consisting mostly of the study of the legal powers, salaries, and terms of office of government officials, with next to nothing about what these officials really do for us or how we can help them in return. The subject, really one of civic hygiene, has been made one of civic anatomy instead. Formerly, the method of amending the Federal Constitution, the qualifications of judges of the supreme court, and the details of the proceedings in impeachment cases were regarded as fundamental knowledge. To-day, knowledge, habits, ideals, and appreciations closely related to promoting community welfare, and through these and out of these, state, national, and world welfare, are being emphasized.

In the past the teacher has not even had good text-books with which to teach citizenship, the texts being largely manuals of the Federal Constitution. No books were written on the methods of teaching citizenship to which the teacher could refer. Hardly any effective experimentation in civic education was carried on. Normal schools and colleges gave little help, and the high schools were busy teaching other less valuable things. General literature in books and magazines contained little that was instructive or stimulating in this direction, and what was published lacked a style that would encourage reading. The great civic stories of all ages had not been selected for school use, and pupil self-government had hardly been given a trial.

To-day the civic aim is beginning to be recognized. A great multitude of new agencies, public and private, have been established for promoting civic intelligence and civic welfare; while examples in participation in school and community government and co-operation may be found on every

hand. Moreover, an increasing number of good civics texts are available, and there is little excuse for the schools not helping the people to realize this great aim of civic efficiency. As a minimal essential in any program of democratic schooling, effective training in citizenship ranks high. That it will be one of the few required courses in elementary, secondary, and higher schools before very long is already apparent. Our present need is adequate and scientific selection of subject matter, methods, and administration of civic instruction.

II. A Program of Civic Education

The old course in civics having lamentably failed within recent years, whatever its success may have been in the "seventies" and "eighties" when it was being generally introduced into the schools, the question is put directly up to the educators: "Have you anything better to take its place?" Fortunately, this may be answered in the affirmative, and the remainder of this chapter will be devoted to a discussion of the new type of civics.

Theory of the New Civics.—The object of teaching, generally, may be stated as twofold: First, cultural, to acquaint the child with his environment; second, practical, to train for citizenship. There are various sorts of environment, each with its corresponding field of study. Among others is that man-made, social environment which we term the community, and the study of which we call civics. The community has been well-defined as a group of people in a single locality, bound together by common interests and subject to common rules or laws. And the various types of community include the home, the school, the church, the shop, the state. A citizen is any one who participates in community action, sharing its privileges and properly subject to a share in its duties and responsibilities. The good citizen is one who manfully shoulders his obligations as a citizen and performs his part well as a member of his community. All are citizens, whether young or old, for all are members of one or more of these communities —always including the state.

Civics, then, on its cultural side is the study of that social environment we call the community; on its practical side it is a training for efficient community service and particularly in that type of commu-

And what is more important for citizenship and health than the co-operative community of an outdoor swimming-pool? South Parks, Chicago

nity which we term the state. And this leads us to the conclusion that civics as a school subject includes both a curriculum of studies and a curriculum of activities. How far away this leads us from the old-time book-memorizing endurance test can well be imagined.

The steps in this newer sort of civic training would naturally be: first, to secure a fund of practical information about civic problems; second, to arouse interest in these problems; third, to stimulate to such co-operation with community agencies as the maturity and experience of the pupil enables him (or her) to offer—for, be it remembered, the "good citizen" must be *good for something*. Equally patent, it would seem, but so long overlooked in the teaching of civics, is the method of approach. From the near to the remote, from the simple to the complex, from the concrete to the abstract, from function to structure, from the small problem to the greater, from local to state and national, from matters of current interest to those of origin and growth—how else than by this method—at once scientific and common-sense—can the live interest of boys and girls be roused and their wills and attitudes be trained to lend a hand wherever they can? And this making of good-for-something citizens—of city, state, and nation—is the final goal of the New Civics.[1]

III. The Indianapolis Plan

Two main types of civic education for the elementary school are emerging from the various attempts to organize this work along new lines, which may be termed the "Indianapolis Plan" and the "Philadelphia Plan," respectively. While one in aim and in point of view, these differ materially in method and in detail. Each has much to learn of the other, and in time the two methods will no doubt become substantially identical.

The following brief description of the civics work in the Indianapolis schools is based on a careful analysis of it made by one of its promoters, Mr. Arthur W. Dunn, and given by him in Bulletin No. 17, 1915, U. S. Bureau of Education.

Civics Correlated with Other Activities in First Seven Grades.—In Indianapolis civics is not taught as a separate subject till the eighth grade, though it permeates all the work

[1] Quotation from Professor Barnard's article in *The Annals* for September, 1916, a volume entitled "New Possibilities in Education."

of the school from the first year to the eighth. Mr. Dunn says of this that the aim is "to make of education, not a process of instruction in a variety of subjects, but a process of living, of growth, during which the various relations of life are unfolded—civic, geographical, historical, ethical, vocational, and so on," following largely Professor Dewey's ideas. Accordingly, the English, the mathematics, the geography, the history, the construction work, even the school gardening and the playground activities, are correlated and utilized as a part of the child's civic education.

Naturally, history and geography are the studies that lend themselves most easily to the "socializing" process. Throughout the fourth year geography serves as "the chief centre for the organization of historical and civic knowledge," while the sixth year finds history sharing this honor. Wherever practicable, the work in English composition, both oral and written, "draws largely for its materials" on both the geography and the history, and "affords an opportunity for the discussion of civic questions."

What is more remarkable than the civic history and civic geography is the "community arithmetic." This is nothing more nor less than the ordinary arithmetic getting its data from the life in which the children participate and "fixing important social and civic ideas" in their minds. But imagine a course in arithmetic that trains the pupil to calculate the cost of furnishing a real home, of lighting and heating it, of providing the food and other necessities for a day or a week, always having in mind the possible savings that may be effected by careful buying; and that then goes to work on some of the "actual operations or transactions in the industries of Indianapolis." And what is more, the business men of that city are helping to formulate these problems in "community arithmetic." From these the transition is easily made to problems relating to the various governmental agencies of the city, such as the fire department or the city hospital. Naturally, the problems "vary from school to school

and from time to time, in accordance with current interest and occasion."

Emphasis has been placed on the "community arithmetic" because it so well illustrates the method and the point of view of the Indianapolis plan of training boys and girls to be intelligent, effective citizens *now*. Citizenship is theirs already; good citizenship must be achieved and made habitual.

The Eighth Year.—The stated course in civics for the eighth year is a rapid survey of the various elements of civic welfare, such as the protection of life and property, the safeguarding of health, the affording of means of education, of recreation, etc. Rightly, this is "not primarily an analysis of government." It is intended, rather, "to give the pupil an organized conception of what his membership in the community means. Government is discussed throughout the course as the supreme means by which the entire community may co-operate for the common welfare. At the end of the course the main features of governmental organization are discussed in the light of what has preceded. . . . Co-operative activity for the common good is the key-note to the entire course."

Advantages and Disadvantages.—The great element of strength in this plan is at the same time its source of possible weakness, namely, the perfect co-ordination of all the work of all the teachers who must co-operate every day in the year to make the plan a success. One can see that, as new teachers are constantly coming into the school system, the most careful supervision is necessary. In order that the plan may succeed there must be unremitting vigilance, together with unusual tact and sympathy in the supervisors. That Indianapolis believes it has succeeded with a plan so ideal is a great tribute to the organization and personnel of its school system.

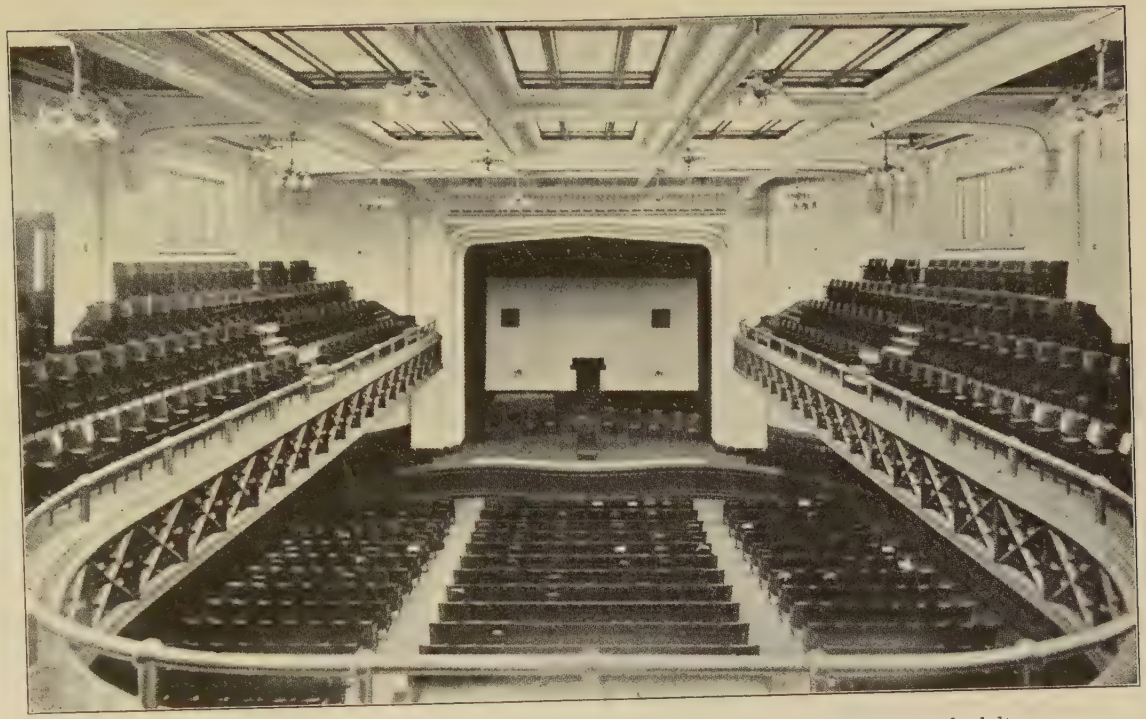
And now for a somewhat different method, that has identically the same object in view—education for civic efficiency.

IV. The Philadelphia Plan

The Philadelphia Plan is based on the idea that the work in civics will gain in effectiveness if it is regularly scheduled, by name, in every year of the elementary school, for at least two periods each week. The civic training thus becomes as steady and as cumulative as that in English or in mathematics. Moreover, this arrangement enables the distinctively civic material that lies scattered throughout the various subjects of the elementary curriculum, much of which would ordinarily be lost, to be gathered up and combined with the more strictly governmental concepts that enter into any course in civics. For example, "public sanitation" is lifted bodily out of the course in physiology and hygiene and set down, gently but firmly, in the civics course. This results in confining hygiene to its individual application (personal hygiene), while community hygiene is given its appropriate social setting and application.

In classes with the single class-teacher in charge the transition from "individual" to "community" hygiene, for example, is made so easily and naturally, regardless of the "label" on each, as to be imperceptible to the pupil. Where the departmental system is in vogue this transition is more noticeable, but the pupil is not troubled by it, as it blends into the general characteristics of the system itself. In either case, the pupil runs no risk of having his civic education encroached upon and minimized by other studies in the curriculum, or by lack of co-operation among the teachers. Experience shows that in the ordinary school the indistinct subject gets lost in the school's activities. The civic aim of education is too large to be lost because lesser subjects fill the program.

If the following description of the Philadelphia course is in more detail than the account already given of the Indianapolis course, this is due solely to the writer's greater familiarity with the former, since he helped to formulate it. Mr.



An auditorium is to-day considered essential in public schools—for both children and adults

Dunn has given details on the Indianapolis plan in the bulletin mentioned.

Details of the Plan.—In the earlier grades the attempt is made to organize the teaching of the basic civic virtues, such as obedience, cleanliness, orderliness, courtesy, helpfulness, punctuality, truthfulness, thoroughness, honesty, and the like. Knowledge and ideals of these are inculcated through stories, poems, games, and dramatization of the stories told by the teacher. Habits are encouraged by helping children to act out and to live the ideals. As stated elsewhere by the writer, the aim is threefold: "To establish right habits of thought and action in the children; to project these habits into the home and into their other relationships as well; to show the pupils how all community life is based on the embodiment of these virtues in each member of society."

Later, the pupils are made acquainted with that all-embracing community life round about them, wider than the home and school, which is constantly ministering to their needs and without which they would perish. They come to learn of the services rendered them and their families in a personal way by the milkman, the baker, the grocer, the plumber, the doctor, the dressmaker, and others. And from these the transition is easy to those equally personal services rendered by the policeman, the fireman, the street-sweeper, the ashes and garbage collectors; and then the pupils are ready to project their thinking to those who bring water and gas and electricity and the telephone into their homes, who transport them from one place to another, who make it possible for them to communicate with their friends by letter.

It is believed that through this process the young citizens may come to understand and appreciate what this great outside world is doing for them and what they may do in return. What is more, they will discover that those who are doing the worth-while work of the world must embody those very civic virtues of punctuality, courtesy, thoroughness, and honesty that they themselves are being trained to practise.

The day may not be far distant when all may learn that "good civics" and "good business" are synonymous terms.

The Local Occupations.—For purposes more or less local, but believed to be of application in or near any industrial community, one whole year (the sixth) is devoted to the great industries that have made Philadelphia famous, and to the varied occupations of the city, many of which are open to boys and girls. While serving as a sort of vocational-guidance course, both for those who are to leave early and for those who are to remain longer, this "industrial-civics" year will fail of its purpose if it does not impress the youngster with the essential equality of the workers and the marked inferiority of the drones. The "blind-alley" occupations, often more attractive at the start than those which lead somewhere, are carefully noted, as well as the ethics of getting and keeping a job.

The Seventh and Eighth Years.—During the last two years the work is based on the idea of discovering how the various elements of civic welfare—namely, health, protection of life and property, education, recreation, civic beauty, communication, transportation, wealth (the making of a living)—are secured to each pupil and his family through community action. That is, in return for the specialized service rendered the community by the father or mother, the community, through the medium of wages or salary, does all those things for the family in return. Unfortunately, there are some who either cannot or will not secure these elements of welfare for themselves except in a way which the community regards as anti-social. These naturally become wards of the state, and must be aided by the community both for its own protection and for the possible reformation of the offender. These last are considered under the captions of "Charities" and "Correction."

Then follow two closing sections, entitled, "How our laws are made" and "Party government," each of which is self-explanatory. It might be well to add, however, that the

latter includes a brief discussion of party organization and election machinery, so far as either would be of interest and value to the class.

Methods.—Each general topic receives a threefold treatment: first, the approach, where the topic as a whole is presented to the class in some vivid fashion that shall arouse the pupils' interest and make them see its importance; second, the agencies, public and private, through which the community secures the end it is seeking; and third, the responsibility of the young citizens of the class to co-operate to the best of their ability with the various civic agencies.

Numerous trips—for example, to the fire-station, to a filtration plant, to a garbage-disposal plant, and to museums—help to make more real to the pupils both the services rendered and those who render them; and especially when these trips are followed by class reports and discussions.

The progression is usually from city to state to nation, not forgetting to emphasize the part played by private organizations. The latter is done for two reasons: first, because the work of governmental departments, bureaus, etc., cannot be understood apart from the help they receive from private organizations; and second, because the young people must come to appreciate the fact that these voluntary associations are the principal means through which the ordinary citizens can unite most effectively for civic endeavor.

Junior High School Civics.—It is altogether likely that should the complete junior high school (grades seven and eight and first-year high school) finally arrive, the last of these years will find room for at least a term of advanced vocational civics. This will continue the vocational information begun in the earlier grade, and give the boys and girls some notion of the larger industrial or professional opportunities that lie ahead for those who go through the senior high school. Moreover, they must discover that the highest type of good citizen is the one who "does not allow himself to become so engrossed in the process of making a living

as to lose sight of those other duties of good citizenship that he owes to family and friends, to society generally and, above all, to the state."

Knowing and Doing.—Naturally, as already indicated, the new civics includes both a curriculum of studies and a curriculum of activities. The latter must vary from time to time and from place to place, but might include the following collective activities: a certain measure of student self-government; junior civic leagues; organized war on destructive insects; co-operation with civic organizations or even with governmental agencies for neighborhood improvement.

Further Suggestions on Method.—While the following suggestions on method are based primarily on the Philadelphia course, yet they are believed to be applicable to any civics course that is planned on substantially the same lines, whether for a large city or a small one. The only variation that might occur is in the discussion of industrial or vocational civics.

As already stated, the early training in the basic civic virtues would be carried on through stories, poems, songs, games, and dramatization. These should be based, wherever possible, on situations that arise in the schoolroom or on the playground. Each of these is helpful in its own way, for each one helps to form the habit of right social action. No unusual literary or dramatic power is needed by the teacher. However, there is one ability that she must acquire, and that is the art of having a chat about the story or poem or whatever it may be, in the course of which, by skilful questioning, she gives the little folks themselves the chance to point the civic moral. This they will do with enthusiasm and a sincerity that speaks well for the future.

The Doing Side.—So much for the appreciative side of these lessons; now for the doing side; for it must be remembered that the New Civics is both a curriculum of studies and a curriculum of activities. A certain fourth grade known to the writer has a "make-over club" which resulted from

the study of Thrift. Each member, to get in or to stay in, must do some thrifty act which is vouched for to the class. Careful cleaning and mending of the clothing so that it will last a little longer, saving of waste-paper and proper spending of the money received for it, making simple repairs about the house—these are only a few of the many reports that are made to the class at any civics period when the club is holding a business meeting. This is all very real to the children, it is continuous and not spasmodic, and it helps to lay a secure foundation of economic independence and civic strength. Any one of the virtues will lend itself equally well to some form of civic activity.

In the study of the services rendered each pupil and his family by the community round about him, and of how he may lend a hand, the progression of thought is: dependence, interdependence, service. And until the seventh grade is reached, the personal and human side must be kept in the foreground, to the practical exclusion of organization or legal powers. "Biographical Civics" might be a good name for it. The boys and girls are still in the idealizing, in the hero-worshipping stage. They are primarily interested in people that are doing things—in Mr. Policeman, Mr. Fireman, Mr. Street-sweeper; and this personifying of community activity is worth keeping even for the long-range personal services where those who render them are not ordinarily visible to the children.

No needless worry should be indulged in by the teacher that she is lacking in definite information about any one of these dignitaries. All the information needed—say about Mr. Plumber or Mr. Carpenter or Mr. Policeman—will be given with a rush by the class. The teacher's function is not to pour in a stream of facts, but to help the children organize their own fund of information along civic lines, so that they may rightly appreciate the services rendered by each of these community servants and at the same time store up a fund of civic ideals that shall guide them later

as adult citizens. It must not be forgotten that throughout this course information is only a means to an end—a sort of by-product in the training process that is to turn out virile citizens.

Any comprehensive survey of industrial life and of vocational opportunities, no matter how elementary it may be, can hardly be conducted without the use of popular but accurate write-ups of the various industries and occupations to be studied. The hearty co-operation of private organizations—such as the local Chamber of Commerce or Board of Trade, the Consumers' League, Women's Clubs, etc.—can be enlisted in the preparation of the write-ups. These may be planned for use by the teachers or directly by the pupils themselves.

More Mature Study.—Coming now to the more mature work of the seventh and eighth grades, based on a study of the elements of civic welfare, some of the suggestions already made call for further elaboration.

The approach mentioned above, though it usually need take but one or two periods, is of vital importance to the success of the work; for it is here that the pupils come to see the importance of the topic as a whole both to the community generally and to themselves in particular. If the topic is the protection of life and property, the class should discover in the approach that if it were not for the protecting arm the community throws around them, they and their parents and their neighbors would be in constant peril, from one day's end to the other. This end may be reached by having the class enumerate the dangers that beset them on every hand; or, if preferred, the class may name the various safeguards they know of that the community has thrown up for their defense. In either case, the list would be long and impressive. The same sort of treatment would serve when discussing the topic of health. Various methods of approach to these and other topics will suggest themselves to the resourceful teacher.

In considering the various civic agencies, public and private, a beginning would naturally be made with those which touch the pupil or at least come within the range of his experience. This means that the order of progression is usually from local to state and then to national. Moreover, the order of interest is found to be from function to structure, from the administrative department which does things to the legislative which plans the things to be done, and the judicial which interprets and helps to carry out what has already been planned—not the reverse.

The importance of frequent class or other group trips to see the agencies under consideration, with the inevitable class report and discussion, can hardly be overemphasized. A larger part of a civics laboratory lies outside the schoolroom, and obviously the pupils can use this material only where it is to be found. This is better understood in European than in American schools, and in some instances it may be necessary to do a little missionary work with the school authorities.

Programs for junior civic leagues or other school organizations of a civic nature would be hard to outline in advance, as they would depend so entirely on the interests of the pupils and the needs of the community. Any program lacking this prime essential of direct touch with the environment would be a waste of precious time and energy, for it would neither develop civic initiative nor train the judgment in dealing with community problems. Worse still it would probably deaden any interest that had already been aroused, and tend to put the whole study of civics back into the realm of the so-called "informational" subjects, from which valley of dry bones it seems in a fair way to be rescued.

V. Test of the New Civics

Mr. Dunn has probably given us the best formulation of the tests we may fairly apply to a civics course. He declares that unless the young citizen's *interest* shall have been aroused

in community matters, with corresponding motives for participation therein; and unless, in addition, a fair degree of *civic initiative* and *civic judgment* shall have been cultivated in the boy or girl, these years of civic training will have been largely wasted. However, it must be remembered that the gains from such a course cannot be measured with a yardstick or weighed with a pair of scales. They must be evaluated gradually, as they shall appear in the civic life of the young people who grow up under its influence—as is true with all the subtler things in education. Present-day civic problems at the school, the home, and in the community and larger group are serious enough to-day to warrant the most careful study, experimentation, and testing of results. If an objective scale for measuring all or a considerable share of the product, civic efficiency, can be devised, as is probable, so much the better.

NOTE.—The Philadelphia course in civics for the elementary schools may be obtained by writing to the Superintendent of Public Schools, Philadelphia, Pa.

SUMMARY

1. Civic efficiency is one of the great aims of education, and no country ever had a greater need for such efficiency as our own democracy.
2. The New Civics has for its twofold object the acquainting of the child with his social environment, the community, and the fitting of the child for citizenship in that community.
3. The Indianapolis plan for accomplishing this includes teaching civics by means of all the studies of the curriculum, especially geography, history, and arithmetic through the earlier grades, and then teaching it as a separate subject in the eighth grade.
4. In the Philadelphia plan, civics is taught as a separate subject for at least two periods a week throughout the elementary grades.
5. The children learn of the civic virtues, of the community round about them and how it ministers to their needs, and of the wider community of state and nation.
6. The industrial life and opportunities of Philadelphia are studied, its private agencies for social betterment and citizen co-operation are considered, and student activities of a civic nature are encouraged.

7. The young people trained in the New Civics, by whatever method, if it has been a success, will grow up with civic initiative and judgment backed by an awakened social conscience.

PROJECTS IN APPLICATION

1. If you have children above the third grade, try putting the opening exercises partly into their hands. Have a president, a vice-president, a secretary-treasurer elected and have them suggest and make up programs at least once a week. Have children report on current events at these meetings as well as sing, speak, read, discuss community problems, act out little dramas, etc. There are many possibilities in such meetings.
2. What can your school or class do to improve your school building and grounds? How can the children get trees planted, waste picked up, fences repaired, mud-holes filled, turning poles, see-saws, swings, and sand-boxes provided? Will a parent-teacher association help? Can there be established a school orchestra, or a community orchestra, meeting at the school? What other services to the school community can be rendered?
3. Try to get the people of the community to organize for entertainment, public discussions of public questions (local, state, national, and international), for spelling bees using words only needed in correspondence, for ciphering matches, and for general development of the spirit and habit of community co-operation.
4. What local community problems may be discussed with profit in the school and in what grades? Which of these problems may be started toward solution by the school children? What difficulties will arise?
5. Examine the leading text-books on civics and pick out those which you consider best. In what ways do they excel?
6. How much time should be given to regular teaching of civics in class-periods in the first six years? How much time should be given in the seventh, eighth, and ninth years? What stands in the way of giving such time?
7. Do you know of any schools that seem to overlook the civic aim of education entirely, and why? Can the effects of such omission be noticed in the community life?
8. If you teach in a rural or village school get a copy of Field and Nearing's "Community Civics," and see what it offers your children.

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Back numbers can easily be referred to through the use of the "Reader's Guide to Periodical Literature."
34. The daily newspapers are a most fruitful source of civic information, to be carefully checked up, however, with the more reliable magazines already referred to.

C. CIVICS LABORATORY

Material for an ideal civics laboratory would include: Pamphlets, reports, pictures, lantern-slides, plans, charts, maps, samples, etc.

These may be secured from Government departments, bureaus or commissions, or from private organizations, or be made up by the pupils themselves. Use of class bulletin-boards, of filing cabinets, and plenty of shelf room will be found indispensable for this laboratory.

The accumulation of this material will preferably be a slow process, depending upon both teacher and pupils in successive years.

CHAPTER XXII

ETHICS

Preliminary Problems

1. What do you see in the accusation that children of to-day are not so well-behaved as children of a generation ago?
2. Make a list of the principal types of immoral conduct which are problems in the school.
3. How many of these could be obviated by improving the school environment?
4. What improvements would you suggest as most important?
5. Why do we call a baby innocent? When does the age of "innocence" pass?
6. Is immoral conduct always due to ignorance? What may the offender lack instead of knowledge?
7. What is the difference between "moral training" and "teaching ethics"?
8. Who are the responsible agents for moral training?
9. What instinctive tendencies in children lead most in the direction of moral behavior? Immoral?
10. What are the best ways of guiding anti-social instincts?

I. View-Points of the Teacher

The Problem.—We who share with parents the privilege of unfolding and socializing the child's nature must feel keenly the sacredness of our responsibility. Can we be satisfied to measure our work merely by the tests of reading, writing, and arithmetic? Can we be satisfied to judge even the moral status of a pupil by the old standard of stillness and subserviency? Surely we must aspire to something more. We must strive to promote the growth of the moral life of the child as definitely and as positively as we develop any other phases.

We need to foresee the length and nature of the process.

A skilled teacher never grows impatient if a beginner forgets that two times three are six. She knows it takes time for him to learn numbers. But too frequently, if she instructs a child to treat his playmates as he himself wishes to be treated, she feels that subsequent violation of that rule is the child's wanton wickedness or perhaps a sign of wayward ancestry. One must understand that a child begins life as unmoral as he is illiterate. He has the inborn capacity, of course, for both literary skill and morality; but the development of either capacity takes time, patience, and insight. How much time and patience it takes will depend upon two fundamental limitations in each case—heredity and environment. The capacity for moral living varies among individuals just as other capacities vary. Some are naturally more capable than others. Environment also varies. If domestic life and outside experience harmonize with the work of the school, progress is rapid; but when these are counteractive, results are always in jeopardy. Our knowing the child's initial lack of moral responsibility and the limitations which exist should make us patient and persistent in our efforts.

The Goal.—We need also to view the goal of moral training not only in synthesis but in analysis. It is not sufficient that we aim in general to develop moral character. Such a statement of our goal does not point the way. We must aim at things which constitute character, at things which will control the conduct of pupils when they are beyond our immediate influence. If we aim at the development of certain moral habits, for instance, our way is clear. We know the process of habit formation. Likewise, if we aim at imparting certain facts or principles of moral living, we know the pedagogy of instruction; or if we wish to create certain ideals, we know the process. Since it is necessary, therefore, to view the goal of moral training analytically, let us inquire what the specific aims and processes are.

The moral influence of the supervised playground is second to none.
South Parks, Chicago

Thrift teaching through club work of Pennsylvania State College

II. Analysis of the Problem

Moral Habits.—Actions that have become habitual, judgments repeated until they have become established viewpoints, and emotional responses that tend to recur automatically, constitute very important factors in controlling conduct. If a child forms specific habits of sharing with others, these help him to be unselfish. If he acquires the habitual judgment that time is lost when nothing worthy is done, this helps him to be industrious. If he learns from many life experiences to abhor a lie and to love the truth, he is likely to be truthful. Early in life children have no habits of action, no established attitudes, and no moral prejudices. Their first responses are instinctive. Hence every moral situation which will recur often in life is a legitimate field for the cultivation of automatic responses in action, thought, and feeling.

Ideals.—But conduct is not controlled solely by automatic responses. Another control is ideals. A little boy to whom a policeman was the ideal man gave his mother no rest until she had dressed him in a uniform. His ideal was actively influencing behavior. Just as evidently ideals influence the conduct of adults. For example, one has an ideal with respect to church life, and according to this ideal one will be either aggressive or passive, zealous or indifferent, as a member. Influential likewise are the ideals which one has with respect to scholarship, dress, personal appearance, profession, or occupation. Hence a large part of the school's business in moral training is to create moral ideals.

Knowledge.—Fully as important as habits or ideals is one's knowledge of right and wrong. Whenever we put a child into a situation which leads him to learn a moral fact or principle, whenever we give him a better understanding of morality and social relations, whenever we help him to know what is right and what is wrong, we increase the probability of his doing the right. To say that moral knowledge is moral power states one phase of an ancient maxim. Knowledge,

ideals, and habits are not, of course, separate and independent factors of mind. The mind is a unity, and all of these elements are so interwoven that they work together in determining behavior. Knowledge alone will not suffice, nor will ideals, nor will habits; but these do represent different aspects of mental life, each to be developed by methods peculiar to its own nature. We think of habits as a result of drill, ideals as a result of inspiration, and knowledge as a result of instruction; and because these aspects of mind differ in nature and in process of development, we need to make this pedagogical analysis [1].

In carrying out these processes for the accomplishment of our teaching aims in moral training, educators cannot rely solely on a formal provision for the teaching of ethics; nor can they depend exclusively upon the personal influence of teachers nor the moral regulation of school life, nor the incidental influence of other studies. It would be desirable to so organize the school life that moral training grew naturally out of the group activities of the children engaged in worthwhile play and work. An efficient procedure will, so far as possible, include all of these. Through the social life of the school, the modes of recitation, and the subject matter of the curriculum we have a combination of adequate means; and by properly manipulating these means, we should be able to secure intelligently the desired ends [8].

III. The Cultivation of Automatic Factors

Conduct Habits.—Habit building requires intelligent and attentive repetition of a given act on every possible occasion until the act becomes an automatic response [20]. If a teacher desires to have her pupils cultivate the habit of prompt obedience, she must fix their attention clearly upon each directed act, furnish sufficient motive for conscious compliance a number of times, and guard as far as possible against any disobedient response. Such work is obviously incidental to the other work of the school. A special drill period would be absurd.

Upper-grade boys enjoying dancing at Minneapolis, Minn.

Giving the boys a chance at Montclair, N. J.

The daily work of the school offers many recurring situations, calling for prompt, unquestioning obedience; and the school needs only to take advantage of them. In calling a class, in assigning a task, in directing practically every activity of the school, the teacher gives orders. If she makes these orders plain and fair and guards against wrong responses, the habit of obedience will surely develop.

Another illustration is the habit of fair play at snowballing. The best drill-ground is the school yard. When the first snow falls children need to be instructed clearly that it is unfair to throw snowballs at people who are passing along the street or at children who wish to play fox and geese; that it is fair to throw snowballs only at those who are in the game. The presence of many children who always want to be in the game and the existence of huge snow-drifts will insure plenty of practice. The chief difficulty here, as elsewhere, is the prevention of wrong responses; but the temporary withdrawal of the privilege from those who fail to be fair, will usually suffice to keep the practice consciously uniform.

Social Co-operation.—Consider as a final illustration the social habits of co-operation. These habits are essential to modern complex life in all its phases—the basis of both business and governmental efficiency, a prime necessity in philanthropic and religious work; and the school must train children early into such habits. Numerous situations recur in every day's work to afford the practice. Some of them are so familiar to us that we scarcely think of their moral contribution. In school singing, for example, every child sings with a consciousness that he is contributing only a part of the total harmony. Likewise, dramatization is co-operative. The story requires several characters to present it adequately, and each performer is continually conscious of the fact that the success of the whole play depends upon his contribution. In nature study and geography there is always the opportunity to make collections, mould maps, or give demonstra-

tions, and the doing of these things easily involves co-operation. Even in the solution of arithmetic problems children may sometimes co-operate. A teacher once sent her pupils to take measurements of the school yard, for example, and upon these data the total area of the yard was computed and the results given to the school officers as part of an argument for a larger playground. Groups of children can work together at hundreds of well-motivated play and work activities if they are given opportunity. Thus any teacher knowing the value of these co-operative habits can provide amply for their development, at the same time increasing the efficiency of other work.

Be it one mentioned above or any other moral habit that a teacher wishes to inculcate, the principles of procedure are constant. School life necessitates continual conduct, and it is the business of the teacher to direct this conduct into right channels. This in itself fulfils the first step of habit formation. The fact that the responses must be made to a recurrent situation insures the necessary drill, which fulfils the second step. The third requirement in habit-building, preventing exceptions in practice, is the most difficult. But (1) through removing stimuli to wrong responses, (2) through forewarning pupils of the recurring situation and of the right response, and (3) through making right responses agreeable and wrong ones disagreeable, a teacher can keep any prescribed act fairly uniform in practice.

Judgment Habits.—The general method of establishing a view-point or developing an automatic judgment is also a combination of instruction and drill. Through instruction the teacher must lead the pupils either to form the right judgment for themselves or to accept it already formed; and through conscious repetition or drill she must make the judgment habitual. By stating a specific moral judgment and describing its development and cultivation through school activities, perhaps I can make the process clearer.

Suppose we say: "Laws exist for our protection and in-

creased happiness; therefore, we should obey them." Children cannot comprehend this point of view except by a long course of inductive teaching. The school begins when the teacher explains why we act according to a certain rule in school. For instance, pupils must walk, not run, down the stairway in order that no one may fall down and be trampled upon. Nearly every regulation of the school has a purpose which can be stated similarly in plain terms of mutual protection and happiness. The school has only to make this its custom and eventually the desired attitude will be established inductively. Thus through the daily life of the school, through incidental instruction, through the discipline of individual pupils, and through formal lessons, opportunities are ever present for teachers to introduce and cultivate correct moral judgments; and if we are alert in the use of these opportunities, every output of our schools should be in the habit of viewing life from the proper moral angles.

Prejudice.—The third automatic factor in moral control is prejudice. To abhor that which is evil and to love what is good are necessary mental processes for one who would live a good life. But merely commanding one to abhor evil and to love the good cannot accomplish the result. Love or hate, admiration or abhorrence, must be inspired and cultivated, and the pedagogy of this cultivation is essentially the pedagogy of habit-building. The work should go hand in hand with the development of automatic judgments; for when judgment is reinforced by concurrent feeling, the resultant action is much more positive. Two men are equally convinced, for instance, that military preparedness is a good thing. One of them goes on from day to day believing it, but wholly indifferent as to the outcome. The other is anxious and enthusiastic. Necessarily the latter becomes an active campaign worker. Thus every moral judgment which becomes automatic needs a corresponding automatism in the realm of emotional response in order to make it dynamic.

Methods of initiating permanent likes and dislikes in the

minds of children, consist principally in the art of suggestion rather than in the art of instruction. By the tone of voice, the manner, or the facial expression, a teacher who has the confidence of pupils will impart to them her own likes and dislikes. This type of social stimulation has to be real, however, and not feigned. If we would give the young a love for our country, a respect for old age, or a reverence for things sacred, they must behold deep-seated in our lives the same feelings which we would inspire in them. Likewise, they must catch from the lives of their teachers and associates the spirit of indignation for things that are evil.

A similar stimulation of such emotional responses comes through history and literature. Writers readily transmit their own feelings to their readers. Good literature, therefore, stimulates in youthful minds the finest feelings of the race. At the same time a taste for good literature, as it prevents the reading of much that is unwholesome, builds a barrier against the possible evil stimulus of bad literature. In this way, whatever the school does in cultivating good taste, whether in literature, art, music, or other forms of enjoyment, will contribute to the moral welfare of pupils either directly by the creation of correct likes and dislikes or indirectly by the prevention of wrong ones.

IV. Creating Ideals

The ideals of little children are ordinarily concrete. Some personal acquaintance represents all that is worth being. Unfortunately, when the ideal is at this stage of development, it includes all of the eccentricities, the mannerisms, and the undesirable traits, just as well as those that are good. If a boy admires some man for his agility or his good humor, he desires to be like that man in every particular. If the man smokes, the boy desires to smoke: if the man is profane, the boy desires to use profanity. In the development of proper ideals, therefore, the educational problem is to abstract desirable qualities, to dissociate them from the undesirable,

Boy Scouts drum corps, Montclair, N. J.

Fife and drum corps. Out of such activities may come a larger spirit of citizenship and ethical living

and to organize them into a composite ideal of living. For example, a little boy whose father employed a number of wood-cutters, greatly admired one of them who excelled in strength. Naturally he wanted to be like that man, although the man was illiterate and immoral. The boy begged for a small axe until he got it; then for hours he worked to chop down a mere sapling, which finally fell, as he thought, like a huge oak. In all of this conduct the controlling factor was his personified ideal. Evidently the need in this typical case was some influence that would abstract the quality of strength for an abiding ideal, and dissociate it from an unworthy man in whom it was then objectified.

Vicarious Experience.—Naturally the widening experience of a child tends to separate desirable qualities from concrete personality; but the school can aid greatly in the process by supplying at the proper time such characters from history and literature as will best portray these qualities. A child who is admiring physical strength should come in contact through literature with such characters as Hercules and Samson. This will help him to dissociate the quality of strength from a particular personality and will tend to free him from the danger of imitating possible bad qualities in a single object of admiration. In assimilating these vicarious experiences, children are continually idealizing the good and looking with disfavor upon the bad. In fact, that which distinguishes good literature from bad is the power to produce this result. Even our school histories ordinarily present good qualities of characters in a way that commands respect, and the bad qualities they censure. Consequently, there is no more powerful means at our disposal for constructing moral ideas than this touch with great characters in literature and history.

Contribution of Skill.—Psychologists have told us that specific skill tends also to develop an ideal. In other words, any response which becomes a habit of action in a specific field promotes an ideal of procedure that is applicable in other

fields. A child who arrives at school on time every morning will develop a specific habit of promptness; furthermore, he will develop an "on time" ideal applicable to meeting other engagements. The school habit, as such, is not applicable to meeting other engagements; but the ideal is broader. It is evident, therefore, that all the work which the school does in the cultivation of moral habits contributes also to one's ideals.

Contribution of Associates.—Still another large source of influence upon the development of ideals is the personality of associates. This influence may be either good or bad. It will help or hinder, according to the character of the one from whom it comes. So strong is the personal influence of the teacher that some educators have been tempted to rest their case solely on the personality of our teaching corps. This view, however, expresses only a part of the truth. The influence of child upon child is equally as important as that of teacher upon child. Soon after the opening of school a certain little girl began blinking her eyes in a very nervous and unusual manner. Upon investigation it was found that she was trying simply to be like an older girl whom she admired. In a larger way it is true that all children whom the pupils accept as leaders contribute greatly to the development of ideals and the control of conduct in the school. Where the pupil leaders are bad, ideals will deteriorate; where the pupil leaders are good, ideals will improve. Consequently it is a part of the school's business to select the leaders.

Leadership.—Many teachers look upon pupil leaders as a matter of accident. Some pupils, they say, are leaders by nature; and if these happen to be bad, the leadership will be bad, in spite of any effort to the contrary. This analysis, however, is wrong. Natural capacity for leadership varies among individuals according to the law of individual differences. When the worst pupil in a school stands highest in natural capacity for leadership, which would be a rare occurrence, the school has only to suppress that leadership in favor

of some one else. Those who actually assume leadership usually do so because of a definite policy in the school's management. Some teachers have the practice of putting their worst pupil in the position of highest honor on all spectacular occasions. The object is to redeem him by a weight of responsibility. This aim is honorable, but unfortunately the pupil cannot comprehend it. The policy not only encourages the bad boy in his badness, giving him an erroneous impression of the way to secure positions of honor and trust, but it causes the other pupils to accept him as their own respected leader. The consequence is a school of low ideals. A reversal of such a policy will work in every case a remarkable transformation in the moral ideals of the children.

Combination of Means.—No single means which the teacher employs for developing ideals is exclusive. It may be used with any or all of the other means. A certain primary teacher has remarkable success in developing ideals of cleanliness. Once she received a most neglected-looking child, a girl of nine. No sooner had she gained this child's affections than she had her alone one evening in conversation. When their hands came close together, she tactfully told this unkempt child how to bathe. Then they talked about clothing and about hair-dressing. The child, happy and inspired, ran home that night to tell her shiftless father of her new vision—a vision of herself clean and beautiful. Thereafter she was a different-looking child. Analyzing this teacher's work, one finds at least four influences utilized. (1) The teacher, who is admired by her pupils, sets the example. Both in her personal appearance and in the condition of the room, cleanliness is a prime characteristic. (2) She continually commends pupils for being clean and for keeping their books and papers clean. "How nice Mary looks this morning, and how clean!" "Look at John's book—how clean it is!" These are typical comments, utilizing to its best advantage the influence of associates. (3) Even the fairies that children talk about are clean little fairies, and "Goldilocks" is a beautiful girl with

clean hands and curly hair. (4) And last of all, the children are given practice in certain habits of cleanliness. Every morning they clean their shoes; in the evening they clean their desks; during the day, if the hands become soiled, they wash.

Similarly, in the development of any other ideal it is possible to use all four of the principal means which this teacher used with respect to cleanliness. They are, in brief: (1) Influence of the teacher as an example, (2) influence of child upon child, (3) influence of examples from history and literature, and (4) habits of acting according to the ideal in certain situations.

V. Imparting Moral Instruction

Schools in the past, ignoring their greater purpose, have doubtless esteemed too highly their function as bureaus of information. But the present reaction may be too great. Remembering that acquaintance with facts and principles involved in any situation is fully as important as skill in the psychology of response, there should be no objection to giving children as much knowledge of morals and ethics as possible, provided that knowledge be given in the right way and accompanied by the right ideals.

In view of the increasing demand for personal-purity instruction in schools, it is important to emphasize the need of correct ideals as the complement of knowledge. Since any fact may be applied immorally as well as morally, sex instruction may be either harmful or helpful. For example, a debased boy was commercializing his knowledge at a certain school. Boys were trading him marbles and other valuables to instruct them in sex knowledge, obviously to their detriment. Ignorance in this field is safer than knowledge, unless knowledge be reinforced by pure and wholesome ideals. With these dynamic outcomes ennobled, however, purity instruction will yield great power in controlling the sex life according to moral standards. And no agency is better qualified than the school to do this.

What school children can do for the birds. Eliminating nest-robbing, shooting, and stoning by the method of substitution. Courtesy of Mr. C. H. English, Superintendent of Recreation, Omaha, Neb.

Indirect Instruction.—Regarding other phases of moral living, most instruction in the schools at present is indirect or incidental to other work of the school. Recall, for instance, the story in many readers of the boy who called, "Wolf! Wolf!" when there was no wolf, showing in the end how deception harmed the deceiver. Memory gems are nearly always kernels of moral truth, selected on that account. Also in history or geography lessons some moral fact usually appears. In history it may be the great principle of equal rights, the fact of universal brotherhood, or the greatness of unselfish service; in geography it may be the idea of our industrial interdependence. But in every case we should strive to find in each pupil's experience the point of contact for the moral truth. A mere question or a suggestion, not sermonizing, will suffice.

There is also considerable ethical instruction involved in school discipline. For instance, some children ran over a private lawn. The owner complained. In stopping this trespassing the teacher explained the difference between private and public property, and the treatment to be accorded each. Again, when a pupil does things obviously intolerable for all, he is asked to consider what would happen if all children would do as he has done. Thus a child begins to assimilate a profound proposition in ethical philosophy. Even pupil self-government, where it is successful, requires continual instruction in conduct by a competent adviser. In fact, all school discipline is as rich in opportunities for moral instruction as the subject matter of the curriculum is; and the teacher who excels in management is the one who uses them.

Formal Instruction.—Because of these abundant opportunities for incidental ethics, the formal course ordinarily constitutes a relatively small portion of the curriculum. Sometimes it is omitted altogether. Where it does exist, some teachers find the ethics lesson the most difficult of all lessons to teach; others find it among the easiest. It depends upon

the method of teaching. A teacher who knows how to relate an ethical principle to juvenile experience, finds the instruction easy; but one who fails to make this vital contact finds the instruction hard. Usually a single ethics lesson has a double purpose. It aims (1) to impart some important idea, fact, or principle of moral conduct, and (2) to stimulate the growth of a correlative ideal. The teacher who successfully accomplishes this twofold purpose divides her teaching of the lesson into three parts: (1) Finding in the experience of every pupil a point of contact, (2) developing and applying the idea or principle chosen for the lesson, (3) getting a favorable emotional response [12].

An Example.—By describing a particular lesson observed in a fourth grade I can best define these essential characteristics of ethics teaching. The lesson is not considered ideal according to the philosophy of Professor Dewey, but is judged excellent under the formal school conditions which ordinarily exist. The purpose of the lesson was (1) to teach pupils the meaning and significance of perseverance, and (2) to cause them to aspire to that quality of character. The teacher began by asking pupils what difficult thing they had ever accomplished after repeated trials. One boy had been able to ride his bicycle a given distance in thirty minutes after practising all summer; another had solved a problem in arithmetic after many unsuccessful attempts; a girl had learned to play Dvořák's "Humoreske" on the violin after much practice. Thus the teacher found the point of contact. After a number had related similar experiences, she defined perseverance as this very quality of sticking to a task until it is accomplished. The next thing was to present a few examples outside of the personal experience of the class. One child by previous appointment read the story of Bruce and the spider. The teacher told of a former pupil who tried again and again in the face of repeated failure to win a prize in reading. He won it the very last year he was in school. These vicarious experiences enriched the idea of

perseverance which had partially developed in the children's own experience, and strengthened the conviction that perseverance is a winning quality in one's character, thus completing the second step. The fact that pupils were led to admire characters displaying this quality induced them to idealize perseverance, thereby fulfilling the third step. This lesson, therefore, meets the essential requirements of every formal lesson designed ultimately to modify conduct.

Religion.—Religion, as ordinarily considered, has always been a powerful factor in the morality of any nation. It has not been given separate mention in our discussion of moral education because sectarian religious instruction is beyond the province of our public education. We need, however, to work in closest sympathy with those institutions which try to impart definite religious instruction. The intelligent and sympathetic co-operation of specialized religious institutions and specialized educational institutions is conducive to the best type of moral development. The school's share in this co-operation is performed pedagogically when we lay the basis of ethical conduct and show the right reverence for things religious; and it is performed administratively when we recognize the worth of religious instruction. Certainly any careful scrutiny of the modern elementary school that is giving the children not only knowledge and habits but also worthy ideals and appreciations of an ethical character is superior to most Sunday-schools in the essentials of "true religion and undefiled." As a supplemental institution the elementary school is to-day energetically seeking to do its full share in developing moral and religious efficiency. More definite guidance of school activities toward this aim is more imperative than ever. We are in general agreement with the Gary plan of school and church co-operation, and with the general plan outlined by Professor Rugh [21] in his prize essay on "The Essential Place of Religion in Education."

SUMMARY

1. In brief, teachers need to view the work of moral training from the standpoint (1) of its importance, (2) of its length and limitations, and (3) of its analysis into specific aims suggesting the process.
2. Those specific aims are: (1) The development of (*a*) habits, (*b*) judgments, and (*c*) feelings, as automatic controls; (2) the creation of worthy ideals; and (3) the teaching of moral knowledge.
3. The means to be employed are found in the social life and management of the school, in discipline, in methods of recitation, and in the content of the curriculum.
4. The automatic controls are initiated by instruction or suggestion, and cultivated by repeating the response on every possible occasion without any counteractive practice.
5. Ideals, at first concrete and personified, become abstract and composite by force of the child's own widening experience and by the influence of vicarious experience in history and literature.
6. Ideals of procedure result from specific habits and are much broader than habits in their application.
7. All ideals are likely to be modified by the personal example of teacher and pupil leaders; consequently the teacher should not only guard her own example but should select and develop the right sort of leaders, systematically recognizing merit on all occasions.
8. The facts and principles of moral behavior should find a complement in ideals to insure their right use.
9. Most of such facts and principles are taught incidentally (1) in connection with other subjects and (2) in connection with school discipline.
10. Formal lessons in ethics and conduct should aim always (1) to instruct, and (2) to inspire. This will require (1) finding a point of contact in the pupil's personal experience, (2) developing and applying the principles, and (3) idealizing their proper application.

PROJECTS IN APPLICATION

1. Enumerate several recurring situations in a child's life for which he should be prepared with automatic responses, (1) in deed, (2) in judgment, (3) in feeling.
2. State one right judgment and one wrong judgment concerning

work; and show how you could establish the right one in the minds of your pupils.

3. If you are cultivating habits of truthfulness in a child, what are some of the removable stimuli to wrong responses? How could you remove them?
4. Specify some ways in which you can render right responses agreeable and wrong responses disagreeable to the child in whom you are cultivating truth-telling habits.
5. Name one literary or historical character that will inspire children with right ideals, and one that will warn them against wrong ideals, in each of the following directions: (1) Perseverance, (2) truthfulness, (3) kindness to animals, (4) temperance, (5) altruism.
6. Make a list of specific school habits which should contribute to a pupil's ideals of procedure in life at large.
7. Outline a plan for teaching a formal lesson on the subject of obedience, politeness, or unselfish service to society, adapting it to a particular grade of pupils.

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* Indicates the most important references for teachers in elementary schools.

CHAPTER XXIII

MEASURING RESULTS OF TEACHING

Preliminary Problems

1. What advantages were gained when men changed to a carefully standardized yard from the custom of having many different standards, and such standards as the distance from the end of the Queen's nose to the end of the fingers of her right hand, with arms stretched on a piece of cloth?
2. How do such primitive standards differ from the average examination held in school?
3. If a photographic copy of an elementary pupil's examination paper in geography, history, arithmetic, composition, or other subject, is sent to five hundred teachers of the same grade as the pupil examined, to what extent will they agree in their marks if all do their work carefully? (High school teachers vary from forty to ninety per cent frequently.)
4. What is the reliability of the teacher's judgment as to the relative difficulty of spelling words? See chapter on spelling.
5. Of what advantage is it for a boy to have a photographic scale of samples of handwriting on the wall in his room with which he may compare his own handwriting?
6. What help can a specialist in educational measurements give teachers, principals, and superintendent as a regularly employed official of the schools with the rank of assistant superintendent? What cities now have such specialists?
7. How have we determined in the past which method of teaching reading or which series of geographies or arithmetics gave the best results?
8. Which of the following types of mental changes to be made in pupils can best be measured: (1) knowledge, (2) habits, (3) ideals, (4) appreciations (including under this heading attitudes, tastes, interests, prejudices, etc.)?
9. By what aims of education are we to determine what results of education are worth measuring?

The Aim of the Chapter.—The aim of this chapter is to help in the solution of one of the most important problems

in teaching, namely, the measuring of results. The title of the chapter might well have been *Tests Every Teacher Should Know*. For there are now tests that practically every teacher should know and use. These tests are to the teacher what the *thermometer* is to the physician, what the *foot* is to the lumber dealer, what the *yard* is to the merchant, what the *pound* is to the grocer, what the *bushel* is to the farmer. In short, they furnish the teacher with standard units of measurement.

Every teacher wishes to know whether she is succeeding, and to what degree, and most teachers realize how unsatisfactory are their present means of securing information on this point. Ordinarily, teachers are limited to one or both of two sources for knowledge of their success. The two sources are examinations and personal judgment, and it is now recognized that the unreliability of the one is only equalled by the uncertainty of the other. Doctor Kelly treats this matter fully and convincingly in his study of teachers' marks [1a].[1]

The use of standardized tests enables the teacher to know in a scientific way (1) definite grades for her teaching, (2) how far her pupils are from the goals, and (3) what progress her pupils are making toward the goals.

Unfortunately, there are as yet comparatively few well-developed standardized tests, but marked progress has been made within the last few years, and still more marked progress is promised for the near future.

This chapter will deal mainly with such standardized tests and measuring-scales as are available for present use by teachers of limited training in psychology and statistical methods. Those who wish to go into the matter more fully will find help in the appended bibliography. The selected list at the end contains some of the best help for those who

[1] All citations in this as in former chapters are made by giving the number which corresponds to the reference in the bibliography given at the end of the chapters; *e. g.*, the citation made above is to Kelly's "Teachers' Marks," given in full, No. 1a.

are beginning to study this problem. Every teacher should study several of the typical references and then be alert to progress in this line as it is recorded in the better current educational journals and books.

The Available Means of Measuring Results.—Chief among the means of measurement now available are the Courtis Tests [2], the Thorndike Handwriting Scale [17, 22], the Ayres' Handwriting Scale [20], the Stone Reasoning Tests in Arithmetic [33], and the Hillegas Composition Scale [38]. All these have been sufficiently used to prove their value. Among others are the Thorndike Drawing Scale [54], the Buckingham Spelling Tests [44], the Harvard-Newton Composition Scale [36], the Courtis's Standard Practice Tests [3], the Thorndike Reading Scales and Tests [16], the Gray, Kelly [16^e], and Fordyce [16^f] Reading Scales, and the Health and Physical Education Scale by Rapeer [54^c]. Development along this line is very rapid, and doubtless before this book has appeared others will have been published. Contributions have been made in such high school subjects as Latin, geometry, algebra, physics, German, French, grammar, etc.

In point of time Doctor Rice is the pioneer in testing. The publication of his extended researches in the results of teaching was the explosion of a veritable bomb in the educational world [15^a]. Mr. Riley, while principal in Springfield, Massachusetts, also gave the cause a noteworthy impetus by publishing the results of the famous Springfield tests, which showed that school children to-day could in general do better at tests given in 1845 than the children of that time [15^b, 15^c]. But the chief worker along this line has been and is Thorndike. It is to him more than to any other man that we owe our present progress toward the possibility of adequately measuring and evaluating the results of teaching. Thorndike is the father of educational measurement.

What is a Standardized Test?—A standardized test is one that has been given to enough representative pupils

under controlled conditions to warrant the setting of certain achievements as standards which are reasonable of attainment by similar pupils under similar conditions. For example, the Courtis tests in arithmetic have been given under uniform conditions of time allowance, directions, etc., to thousands of pupils in representative school systems [25, 27]. These school systems include New York City, Boston, Detroit, and more than a thousand schools in many states, ranging from New Hampshire to Idaho, and Wisconsin to Tennessee. Mr. Courtis also gave his tests to adults in such representative business establishments as Wanamaker's store; and on the basis of the results of these many tests he has been able to set certain standards which are reasonable and desirable attainments for pupils of the various school ages. This may be illustrated by the Courtis Practice Tests [3]. In Lesson 9 of the arithmetic tests, for example, advanced sixth-grade pupils are expected to learn to do correctly forty-six subtraction examples similar to the following, in four minutes:

146	91	109	57	123
96	44	35	18	60

Cards are passed to pupils with the examples printed on them; all pupils are to begin at exactly the same time and to stop at exactly the end of four minutes. By using this test a teacher may know the degree to which her teaching has been effective in subtraction, and each pupil may know how much he ought to improve by practice, as compared with other teachers and pupils in many places. These same tests are made available for other grades by a graduated time allowance. One teacher's experience in using this test is shown in Figures XIII and XIV, pages 528 and 529.

What Is a Measuring-Scale?—A scale for measuring is a list of samples of known quality so arranged that they are graduated as to excellence. Such scales are derived by hav-

Two classes of the experimental school conducted on the campus of the Pennsylvania State College

An experimental and practice school in connection with a department of education in a college is even more necessary than a laboratory for chemistry, or a farm for argriculture

ing a very large number of samples graded by a large number of competent judges. In order to secure a perfect scale it is essential that the samples include every known degree of excellence, varying from zero, or just less than any degree, to the highest degree of excellence. One of the best accounts of the derivation of a scale is found in Thorndike's "Measurement of Achievement in Drawing" [54]. As a preliminary, Doctor Thorndike selected fifteen drawings of varying degrees of excellence and submitted them to competent judges consisting of artists, supervisors and teachers of art, and students of education and psychology. These judges were requested to rate the drawings according to directions on the basis of their intrinsic merit as drawings.

> There were sent in 376 ratings of the fifteen drawings in order of merit, 60 from artists of sufficient distinction to be listed in "Who's Who in America," 80 from supervisors of the teaching of art, and 236 from students of education and psychology.
>
> The differences in merit between successive drawings in this graded series were defined in each case by the percentages of judges judging correctly. For example, 94.85 per cent of the judges rated *b* as having more merit than *a*, while only 84.5 per cent of them rated *c* as having more merit than *b*. Hence the $b-a$ difference is evidently greater than the $c-b$ difference in the sense of being more often or more easily distinguished [54].

On the basis of these judgments the scale was constructed. It is obvious that this scale is necessarily tentative, but Doctor Kelly has shown [1] that it is very much better than *no scale* for measuring the results of teaching drawing.

How to Use Standard Tests.—Care in the use of standard tests is an essential factor in securing reliable results. The prescribed conditions and directions should be rigidly adhered to; otherwise the results cannot be properly interpreted by comparing them with the standards. Careful following of directions in scoring and tabulating is also important; but, unless one has a considerable number of classes to handle, it is not advisable to take time to learn the short-cut methods

of getting averages, or substituting the median for the average, as directed by Courtis. Nor is it ordinarily worth while to take time to compute *deviations* or *variability*. These latter measures are of value mainly to the educational expert in dealing with large numbers of classes. What is most indispensable to the teacher is the status of her class as a class, and of her pupils as individuals.

How to Use Measuring-Scales.—Accurate matching of the matter to be measured with the various steps of the scale is the essential factor in the successful use of a measuring-scale. The accuracy of matching will be greatly increased by having a number of persons make the comparisons and taking the average of their judgments. Another method of increasing accuracy is for a single person to repeat his judgments and then use the average.

In his monograph on "Measurement of Achievement in Drawing" [54], Doctor Thorndike says on this point:

> In measuring the merit of a single drawing by the scale, the drawing in question should be examined with the scale in view or well fixed in memory and a number assigned to it [3]. The number so assigned to a drawing by any single judge is, of course, far from infallible. If the same judge should so rate a thousand drawings, and then, putting these ratings aside, rate the thousand over again, he would vary, often by more than half a "merit" from his previous judgments. If ten judges should rate a drawing, each without any knowledge of the ratings assigned by the others, the ten ratings would vary. These facts are in no wise an argument against the use of the scale, but simply an illustration of the fact that people disagree more in measuring the merit of a drawing than they do in measuring the weight of a stone. Individuals disagree in all measurements whatsoever. Let a stone that weighs exactly 1,000 ounces be weighed independently by ten men using the ordinary scale found in a store, and probably no two of them will assign the same number of ounces as its measure. If they assign its weight as the number of "16 ounces"—*i. e.*, pounds—to which it is nearest, more of them will assign identical numbers—62 or 63. Similarly, if ten teachers measure a drawing, say that of Fig. 20, to the nearest tenth of a "merit," probably no two of them will agree, but if they measure it to the nearest "merit," several of

them will rate it alike as 2. If they should measure it as 0 or 2 or 4 or 6 or 8, etc., probably nine of them would rate it 2.

The sum and substance of all this is that any fact will be given varying measurements if the scale is made fine enough. When a teacher compares a boy's stature successively with 61 inches, 62 inches, 63 inches, and so on, in order to assign the proper number of inches for his stature, comparison is easy and fairly exact. Ten teachers so measuring the same boy to tenths of an inch gave ratings all between 60.2 inches and 60.6 inches. The process was simple, and the variation of their measurements was only a small fraction of the difference between the shortest and tallest human being in the world. Ten teachers measuring the merit of the drawing of Fig. 21 (to tenths of a "merit") gave ratings of from 7.8 to 11.8. The process was not so simple; and the variation of their measurements was a large fraction of the difference between the worst and the best drawing in the world. But there was no fundamental logical difference in the nature or value of the two sets of measurements. And there would have been far more disagreement had they measured the drawings without the aid of our scale. Ten other teachers measuring the merit of this drawing without the scale showed a range of from 2 to 17! In general, the amount of disagreement is over 50 per cent greater when the scale is not used.

FIG. 21.

We must expect a wide variation in the ratings assigned to the same drawing by this scale. One "merit" is such a difference in merit as twenty-five out of a hundred artists, teachers of art, and other competent men judge wrongly. Hence necessarily it must be expected that, in comparing a new drawing with the scale so as to rate it, "errors" will be frequent and large.

Just as men of science take the average of ten or twenty independent measurements of the weight of a body, if they desire to get an accurate measure of it, so we need ten or twenty independent ratings of a drawing to get an accurate measure of it. And since we are affected with eccentric notions, prejudices, and exaggerations of special details in the case of the merit of a drawing as we are not in the case of the length of a wire or the weight of a ball, it is better to have the ratings made by ten or twenty different judges, rather than by the same judge at different times. *But, whether there is one rating or ten, one judge or twenty, the result will be more accurate with the scale than without it.*

With What Pupils Should Standardized Tests and Scales Be Used?—They should be used with all pupils as soon as the appropriate tests or scales are developed. At present little has been done to help measure the results of children's work below Grade 3. A noteworthy exception is the work of Miss Pepper with kindergarten children [54[b]]. The Thorndike drawing-scale will doubtless prove of value for judging the drawings of primary as well as more advanced pupils.

One of the advantages of the Courtis arithmetic tests is that they may properly be used with any number of different grades, from the third or fourth up, at the same time. This makes them especially adapted to use in one-room country schools.

Measuring Results of Teaching Reading.—Considering the degree to which it is fundamental to all other school work, it is surprising that so little progress has been made in measuring the results of teaching reading. The explanation of this is found in the complexity of the reading process. At least several investigations are now under way, looking toward the standardizing and improvement of tests and scales: One by Courtis [2, 35], one by Brown [16[a]], one by Thorndike [16], one by Judd [16[d]], one by Gray [16], one by Kelly, as described by Doctor Coffman in an earlier chapter, and one by Fordyce.

Courtis's tests are part of his set on English (Series C), and Professor Thorndike's work in this line is published in the September, 1914, *Teachers College Record*, and later issues. The main contribution of these studies is that they enable those who wish to co-operate in their perfection to do so. For those who wish to get a true evaluation of reading work, these scales and tests, though imperfect as yet, are well worth using. Doctor Thorndike opens his study with an analysis of the reading situation. He says in part:

> It is obvious that educational science and educational practice alike need more objective, more accurate and more convenient measures of (1) a pupil's ability to pronounce words and sentences seen;

(2) a pupil's ability to understand the meaning of words and sentences seen; (3) a pupil's ability to appreciate and enjoy what we roughly call "good literature" and (4) a pupil's ability to read orally, clearly, and effectively.

In this investigation the preliminary scales and tests are classified as:

1. Scale *A*—for visual vocabulary.
2. A scale for measuring the understanding of sentences and paragraphs.
3. Scale *Alpha* for measuring the understanding of sentences.
4. A provisional scale for measuring ability to pronounce English sentences—the Gray tentative scale.

Measuring Results in Writing.—From the beginning of the measuring movement the emphasis has been placed on determining the progress in the proverbial three R's, and, next to arithmetic, writing has received the most attention. There are now two scales, each of which is being rather widely used, one by Professor Thorndike [17, 22], and one by Doctor Ayres [20]. Professor Thorndike's scale is the pioneer in this field. The way in which he derived it is described in the *Teachers College Record*, March, 1910. Which of these scales is the better has not yet been determined. Mr. Courtis is making a thorough study of the question as part of his Series C [2], and he, as well as other investigators, is getting these scales standardized as to rapidity and the degrees of excellence to be expected from the respective grades of pupils. Professor Freeman has constructed a scale by which to diagnose errors in handwriting. Professor Starch has devised a slide-rule arrangement for converting speed-marks into quality marks, and *vice versa*. Professor Gray of the University of Texas has devised a chart on which to record the many points of handwriting, and Doctor Ayres has worked out an adult scale, and has ere this, no doubt, a new children's handwriting-scale. In their present form the scales are very valuable. Some of their uses are illustrated below.

Illustrations of the Uses of Scales.—(*a*) *In the Grades.*—In all grades above the second a copy of the scale is kept posted in the schoolroom, and the children taught to read it as a means of determining the quality of their own handwriting. Teachers frequently send children to the scale instead of pronouncing judgment themselves. This is evidently one of the great values of the scale in that the teacher is relieved of the responsibility of personally pronouncing judgment and the danger of any personal feeling on the part of the child is removed to a large degree. Teacher and pupil work together in using an established objective standard. Thus the scale makes it possible to measure excellence of handwriting very much as the units of linear measure make it possible to measure distance.

In the sixth grade of the Training School at Farmville, Virginia, the scale was applied to an entire set of dictation-papers during the last of September and to another set the last of October. In terms of the writing-scale, the gain was as follows: For H. H., 55 in September, 60 in October; for H. R., 50 in September, 70 in October; for J. F., 70 in September, 75 in October; for L. W., 80 in September, 85 in October. Only two of the papers showed no gain, and these stood at 80 and 75 in September, which will be seen by the scale to be sufficiently good not to require gain.

(*b*) *Use of the Scale in a Normal School.*—The use that is made of the Ayres' scale in the Farmville, Virginia, Normal School illustrates the use of handwriting-scales in Normal schools, high schools, or any other school in which there is departmental teaching. A complete copy of the faculty agreement for getting and maintaining good handwriting may be secured by applying to the writer. In brief, the plan provides that each member of the faculty have a copy of the Ayres' Scale for Measuring Hand Writing; that there be a special writing class; that on being informed by as many as two teachers that a student is below standard, the teacher in charge shall call him or her to the special writing class;

that the minimum standards shall be 60 for test papers, and 70 for work done out of class; that after being sent to the writing class the student can only be released by so raising and maintaining his or her standard that the teachers of his or her respective subjects recommend it.

(*c*) *Use of the Scale in School Surveys.*—Another of the noteworthy uses of these scales is found in the better school surveys. Figure I shows a graphic summary of such use in the Ohio State Survey [56].

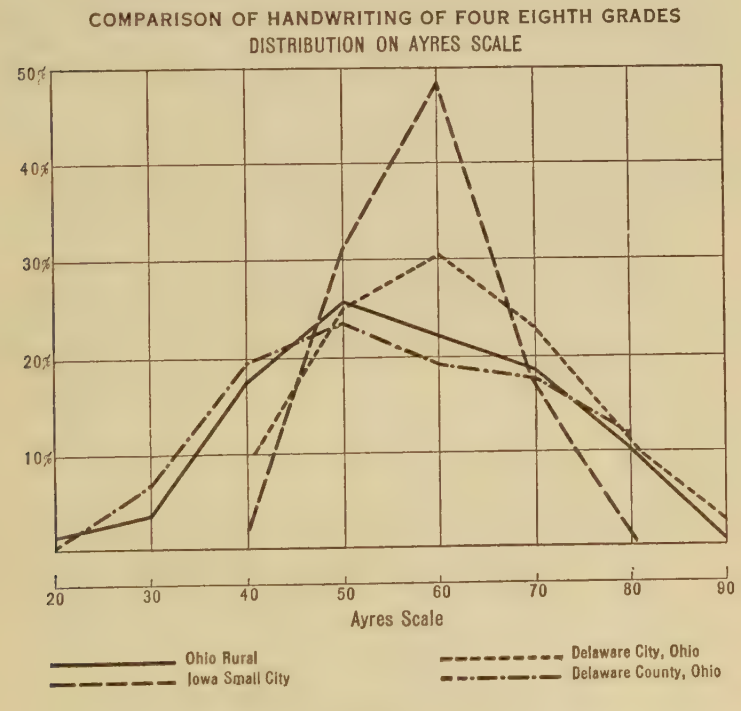

FIG. I

Like all other graphic representations, this figure is of value because of the large number of facts that it brings into view. Those who are not accustomed to reading graphs may find some difficulty with this one at first; but a very little time and effort will yield greatly increased ability, and the facility with

which comparisons of records can be shown makes graphs a common method of portrayal.

After a little practice it will be seen at a glance that the Ohio rural-school pupils varied much more widely in their ability to write than did the pupils in the Iowa small city, *i. e.*, the heavy black line shows that about 2 per cent of Ohio rural pupils stood only 20 in writing, 3 per cent of them stood 30, 18 per cent of them 40, etc., and 1 per cent of them stood 90; but in contrast to this wide variation from 20 to 90, the Iowa small-city pupils, as represented by the broken line, varied only from 40 to 80, with very few at 40 and very few at 80. It is also seen that the Delaware City pupils varied only from 40 to 90, with few at 40 and less at 90, and that the Delaware County varied almost as much as the Ohio rural as a whole. By using this graph the teachers and supervisors of Delaware County can compare the work of their schools in writing with (1) the work of Ohio rural schools as a whole, (2) the work of the schools of Delaware City, (3) that of the Iowa small city; *e. g.*, the heavy black line shows that about 18 per cent of the Delaware County pupils stood only 40 or less, while only about 2 per cent of the Iowa small-city pupils stood as low as 40.

The survey investigators draw the following conclusion from the results of these measurements:

"Some pupils in unsupervised rural districts did as well as any students in the supervised city system. There is no reason why, with supervision, all rural districts should not obtain as good results as any city districts."

Measuring Results of Teaching Arithmetic.—The standardized means of measuring results of teaching arithmetic are the tests of Stone [33], Courtis [2, 25, 27], Studebaker [33^a], and Thompson [9^a]. The Courtis tests in fundamental operations have been most widely used and are most thoroughly standardized. Their availability and the lucid directions which accompany them are also qualities which are attracting teachers to their use. Series A and B are designed mainly for measuring a given *status* and are known as research tests. They may be had from Mr. Courtis.[1] As is indicated in the name, the Courtis *Practice* Tests [3] are designed mainly for securing progress and are known as practice tests. They are published by the World Book Company [3]. Both Series A and B are printed in different forms, so that measurements can be repeated without the danger of the tests having been memorized.

Series A has been largely discarded in favor of Series B.

[1] Public Schools, Detroit, Michigan.

There is no doubt but that Series B is superior for most purposes in that it is more in accord with life demands. But as long as courses of study require teachers to use a large part of the arithmetic time during two or more primary grades on the isolated combinations, tests I to V, of Series A, ought to be used to measure progress in that work.

The Thompson tests deal too exclusively with isolated combinations, and they do not appear to have been very widely standardized.

The development of standardized tests in reasoning has been less rapid than in the fundamental processes. This is because of the greater complexity of the reasoning processes and the lack of accurate knowledge regarding reading ability. Of those available the Stone tests [33] in reasoning are regarded as the most satisfactory.

A recent book for elementary teachers by Chapman and Rush, entitled "The Scientific Measurement of Classroom Products," and published by Silver, Burdett & Co., gives the principal scales up to 1917 for measuring arithmetic, handwriting, reading, spelling, composition, and drawing, and shows how to use them. Its simplicity is commendable.

The following graphs will illustrate some of the values of using tests. All but the last one are based on results of measuring with the Courtis tests. Figures II to X are from Series A; Figures XI and XII from Series B; Figures XIII and XIV from "Standardized Practice Tests," and Figure XV from the Stone Reasoning Tests.

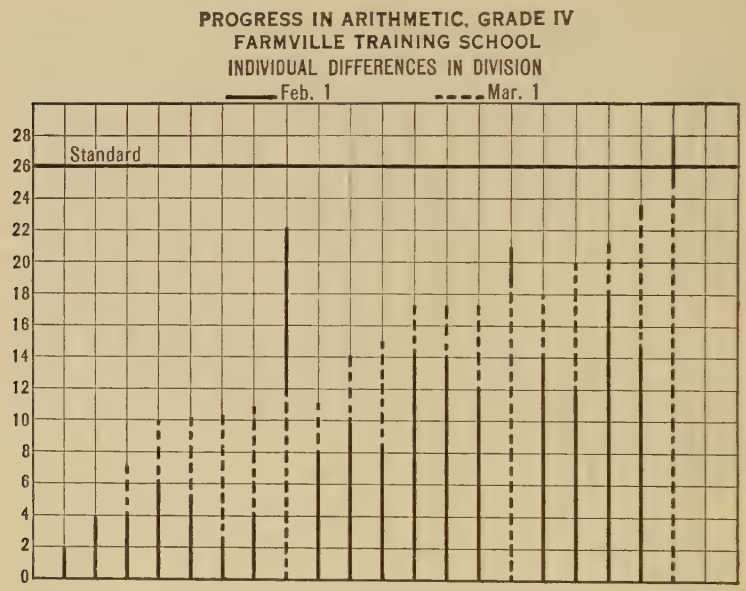

FIG. II

This is one of the simplest forms of graphical representation. As is readily seen, it represents the respective standings of twenty fourth-grade pupils at mid-year and again a month later. The heavy black lines represent the progress that had been made in *division* by the end of the first semester. The dotted lines show the progress that had been made a month later. During that month approximately ten minutes were given to weaknesses as found among *all* the various fundamental operations. Like gains were made in the other tables. Probably the most striking fact shown by this graph is that of individual differences. These children were carefully graded as they were promoted from Grade 3, but at the end of a half-year they differed in division to the extent of one pupil being able to do only two combinations, while another was able to do 28, and the gains during the months of special treatment are even more striking in their differences. Even though the seven lowest pupils were in a group by themselves and given special attention, two of them made absolutely no gain, while several others, with much less attention, made gains of six points. As the graph shows, three pupils made losses in the month. For the one that was above standard on February 1, the explanation is that he gave his time and energy entirely to something else. The others suffered from physical disability during the month.

By having this graph before them, pupils and teacher were able to see just where they stood, first, with reference to each other, and, second, with reference to the standard to be attained by the end of the year, and they were also enabled to see just what progress they were making.

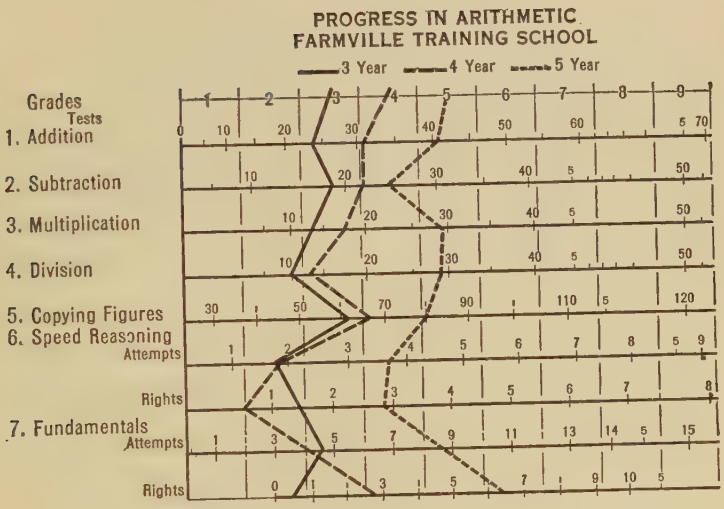

FIG. III

This graph shows the progress from grade to grade. When these children left the third grade their ability in arithmetic was represented by the solid black line. As will be noted, the degree in which they as a class were at standard is indicated by the degree to which the line is perpendicular. If this graph had been before the teacher and supervisor of these children, it is doubtful if the record would have been as is shown above. The records were carefully kept, but in tabular rather than graphical form, with the result that the weaknesses were not fully realized. For example, the graph shows emphatically that these children were very low in division when they left the fourth grade. This placed an undue load on the fifth-grade work, with the result that subtraction was slighted and the children did not make standard progress in it; it also shows that the children were stronger in knowing *how* to add, subtract, etc., than in knowing *when* to perform these operations. (However, Mr. Courtis has since somewhat modified his standards in reasoning.)

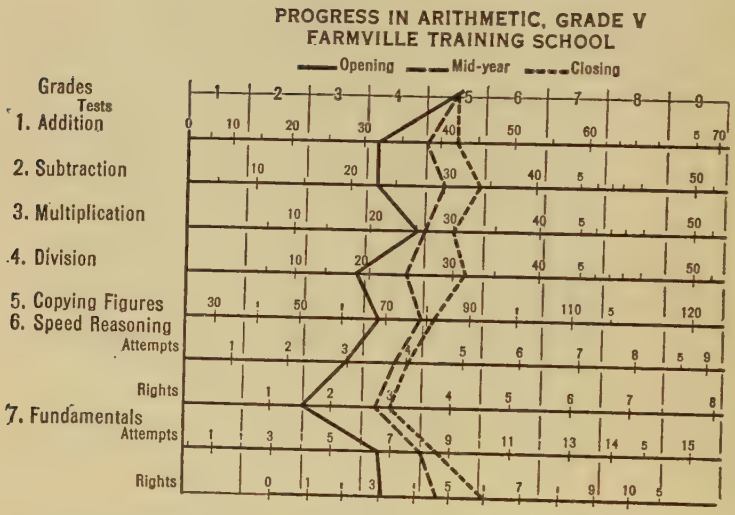

FIG. IV

This figure represents progress in arithmetic while the class was in the fifth grade. At the opening of the year they had only that ability which is shown by the solid black line. As is illustrated in Fig. V, however, this does not mean that they were as deficient as this when promoted into the fifth grade. By mid-year they had made the gains indicated by the dash line, and at the close of the year they were well up in everything, with the possible exception of speed reasoning. By having this record the teacher was helped to know where to stress the work; for example, more time and energy was needed on addition and subtraction than multiplication, and division was weakest of all. They also showed weakness in the copying of figures, which indicated lack of muscular control.

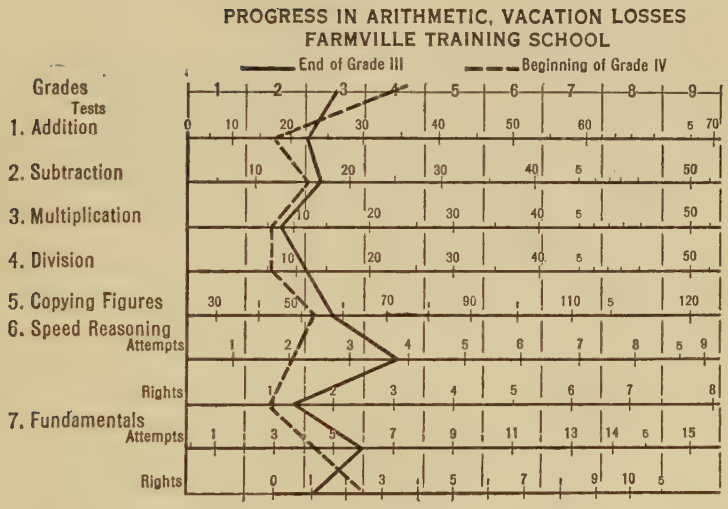

FIG. V

The above graph is a clear representation of what has frequently been felt, but rarely known with certainty, namely, that vacations are times of marked loss. Many measurements in different schools agree with this one. Whatever may be said in favor of vacations, they are hard on what the children go to school for. Such records as the above are of great value in that they show the teacher receiving the class two sets of facts: first, where the children stood when promoted to her; second, where they stand when she is to begin work with them. These facts make it entirely unnecessary for any one concerned to wonder how well these children were taught during the year preceding their promotion. They also show just where the preceding year's work needs reviewing.

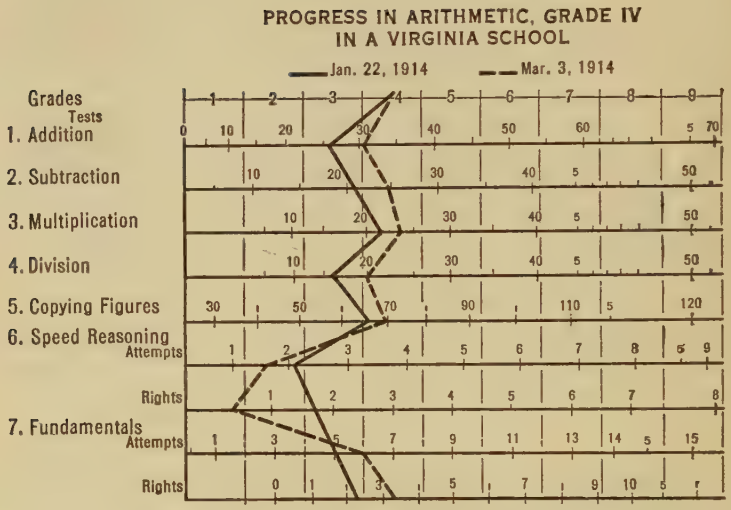

FIG. VI

This graph is a clear indication that gains in the fundamentals do not necessarily mean corresponding gains in reasoning. By having such a graph this teacher could see clearly that she had enabled her children to make good progress in everything except reasoning. For the time consumed these children had learned well *how* to add, subtract, etc.; the next thing was to learn *when*.

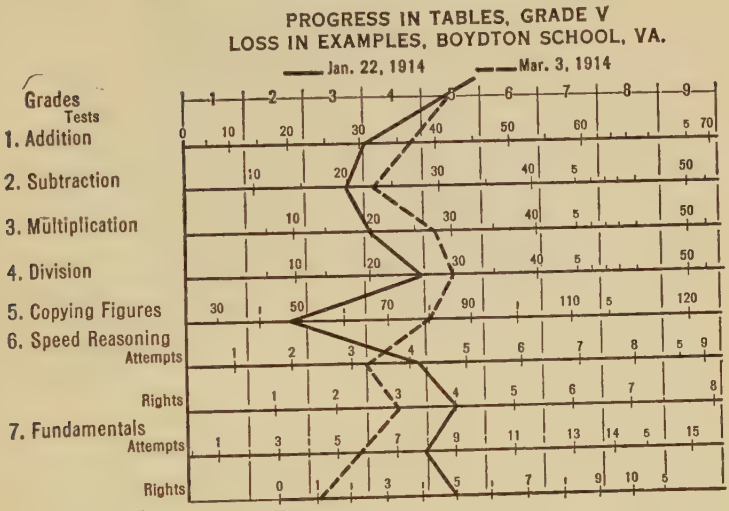

FIG. VII

The above record helped the teacher in that it showed clearly relative strengths and weaknesses. This class was found on January 22 to be well up in rights of both fundamentals and speed reasoning, but below standard in the combinations of addition, subtraction, multiplication, and division, and very low in copying figures. The natural conclusion of the teacher was that her pupils needed to improve in the combinations and she went to work with them on those lines. After five weeks the pupils had the ability represented by the broken line. This shows the surprising state of having gained in the combinations but lost in reasoning and the examples in fundamental operations. That is, learning to add, multiply, etc., in isolated combinations, not only does not necessarily mean a corresponding gain in ability to work examples in fundamental operations, but in this case it meant a very appreciable loss. This is only one of many similar cases that have developed from using Series A. As a result, Mr. Courtis is recommending that Series B, which contains no isolated combinations, be substituted for Series A. This point is further discussed later on. The question of how much time pupils should spend on the tables is still an open one; but the results of many measurements, similar to the above, make it certain that before teachers can be sure that their pupils know how to apply the tables, even in abstract examples, they must teach them and drill them in such examples. Though they are still comparatively untried, it seems clear that for grades above the fourth (and perhaps for all) the Courtis Standard Practice Tests meet this need the best of anything we now have.

The error of the teacher whose work is represented in the above graph is that she did not recognize that her pupils were mainly deficient in speed,

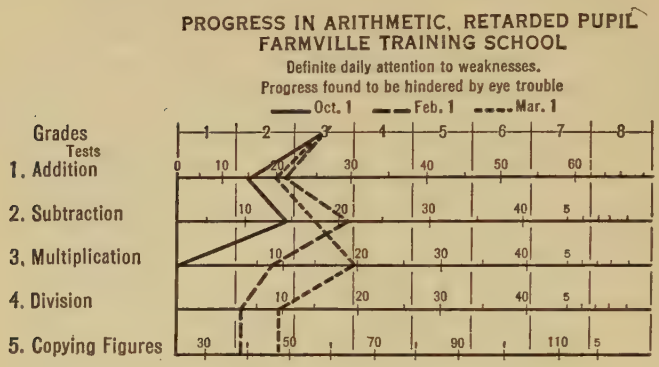

FIG. VIII

This figure illustrates the help that *measuring results* is in locating a retarded pupil. In all his oral work and by all the usual tests of school and life, this boy was unusually bright; yet at the end of a half-year in Grade 3 he was hardly able to do second-grade work in writing these simple combination tests. Some suspicion of eye-trouble had been aroused by his behavior in reading, but not until the above representation of his lack of progress did his teacher and parent take the matter up and have his eyes treated by a specialist.

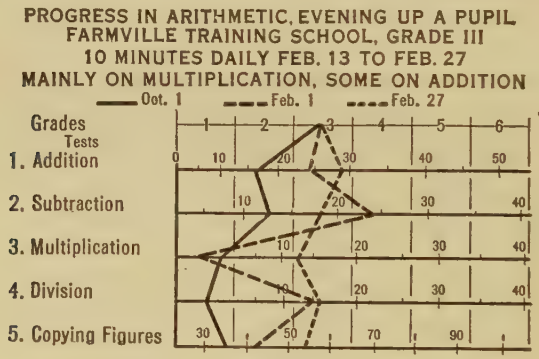

FIG. IX

Every teacher would like to help every pupil do what is shown in Figure IX, viz.: make rapid and all-around progress. From being able to do only low second grade in most operations and working none at all in multiplication and division, this girl became even more irregular by the middle of the year, as is shown by the dash line, but with a very low time cost she became markedly regular in two weeks' time.

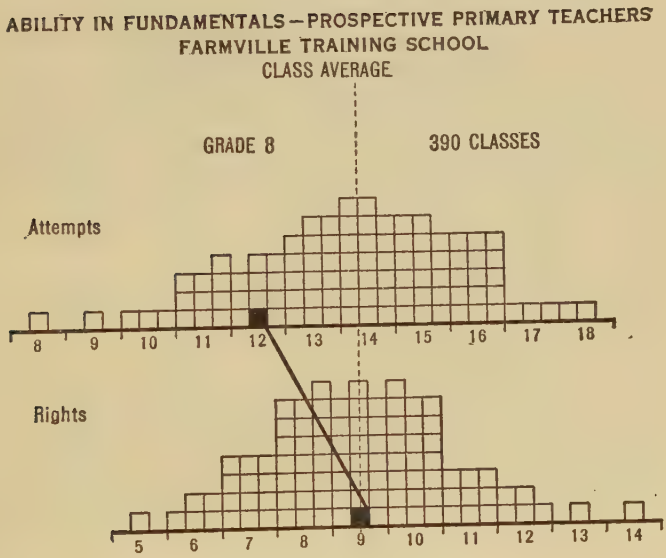
ABILITY IN FUNDAMENTALS—PROSPECTIVE PRIMARY TEACHERS
FARMVILLE TRAINING SCHOOL
CLASS AVERAGE
GRADE 8
390 CLASSES
Attempts
8 9 10 11 12 13 14 15 16 17 18
Rights
5 6 7 8 9 10 11 12 13 14

FIG. X

This graph is constructed on the basis of the results obtained from measuring 390 eighth-grade classes, and, as filled out, it shows that as a class a group of twenty-five prospective primary teachers ranked well above the eighth-grade average in attempts and exactly at the average in rights. By adding their individual records to this graph each of these young women was able to realize where she stood in the fundamental operations, (1) as compared with eighth-grade pupils, and (2) as compared with her classmates.

RECORDS OF PROGRESS IN SERIES B
GRADE VI, FARMVILLE TRAINING SCHOOL

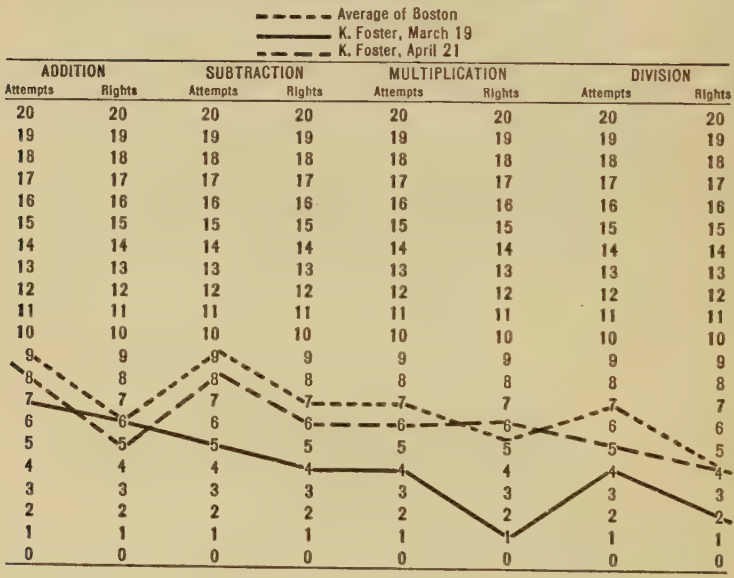

FIG. XI

This graph is for Series B. It represents class growth.

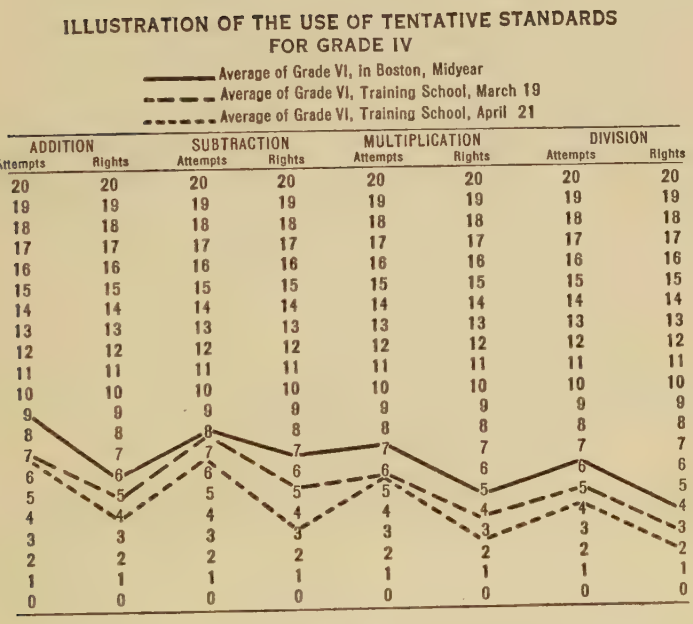
ILLUSTRATION OF THE USE OF TENTATIVE STANDARDS
FOR GRADE IV
Average of Grade VI, in Boston, Midyear
Average of Grade VI, Training School, March 19
Average of Grade VI, Training School, April 21
ADDITION
SUBTRACTION
MULTIPLICATION
DIVISION
Attempts
Rights
20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0

FIG. XII

This illustrates the use of the graph to record the progress of individual pupils. Pupils can be readily taught to make their own graphs and such records make a strong appeal to the pupils for work and self-drill on revealed weaknesses.

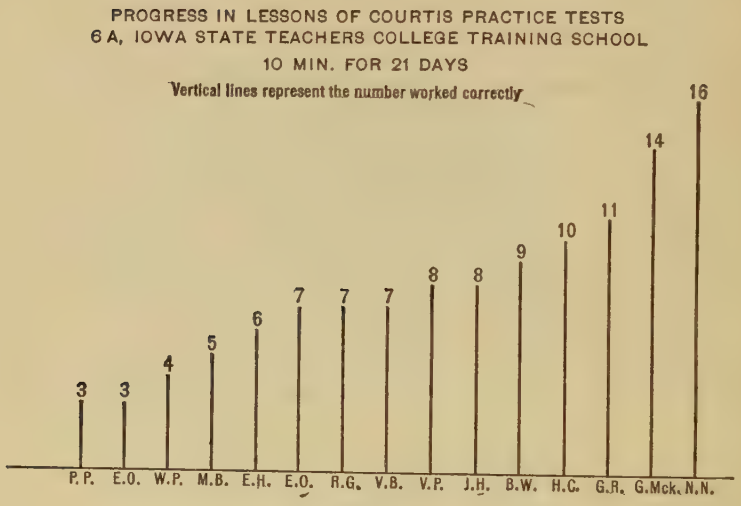

FIG. XIII

This figure shows one of the noteworthy values of the Courtis Practice Tests, viz., that they enable every pupil to work up to the full limit of his capacity and still remain a member of the class. All pupils work at the same time, but each on the particular piece of work for which he is ready. In the twenty-one days during which the above record was made the pupil completed the lessons as represented by the vertical lines, *i. e.*, while two pupils, P. P. and E. O., were conquering three lessons each, pupil G. McK. conquered fourteen lessons and pupil N. N. conquered sixteen, while the other pupils varied between these extremes. And all these pupils did all their class work on these lessons in the same ten minutes. Here is evidently a noteworthy means of economizing time. For a skilful teacher can handle a roomful of children at one time and have each pupil working at his maximum. Then as soon as the quicker ones have attained to the grade standard they can be promptly excused to use their time to better advantage along some other line.

PROGRESS IN COURTIS PRACTICE TESTS

Illustrated by Typical Pupils, Grade 6 in
Iowa State Teachers College Training School
Lesson No. 7 Addition (17 Examples)

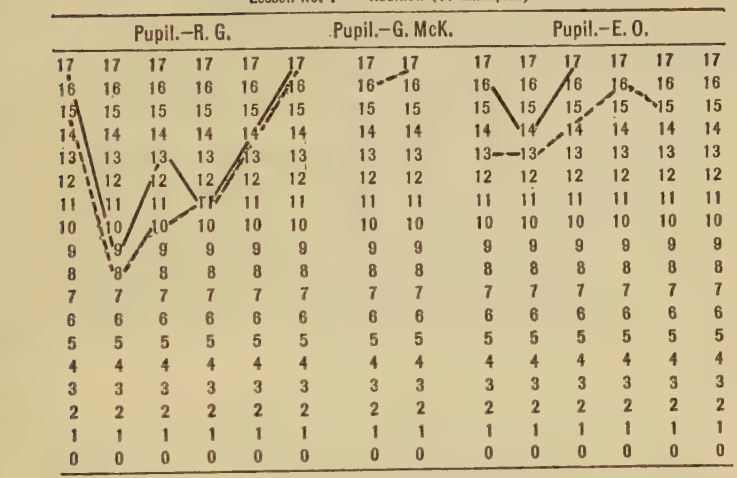

FIG. XIV

The varying progress of three types of pupils in conquering Lesson Seven—17 addition examples—is here portrayed. R. G. was able to get all 17 examples correct in six days, G. McK. in two days, and E. O. has worked five days and has not yet made a perfect score. R. G. located his difficulty—excess of rapidity—the first day, settled down, and made definite gains, which carried him steadily to success; G. McK. had no trouble with this lesson, and E. O. has worked five days apparently without locating her difficulty. This shows hers to be a case for careful study by the teacher.

FIG. XV, Page 530

This graph is reproduced here by permission of the school authorities of Butte, Montana. It is based on the results of using the Stone Reasoning Tests, and represents "the percentage of children making the given scores in reasoning problems. For example, 19 per cent of the fifth-grade children made a score of 0; 19 per cent made a score of 1; etc. The lines representing the median scores for each grade tell about how many in each grade surpass the median scores for the grades above, and how many fall below the median scores for the grades below."

The dotted line was added by the writer. It indicates the median score (5.5) made by 152 advanced sixth-grade classes in twenty-six different representative school systems [33]. The addition of this line makes it possible to compare the reasoning abilities of Butte pupils with those of other representative school systems.

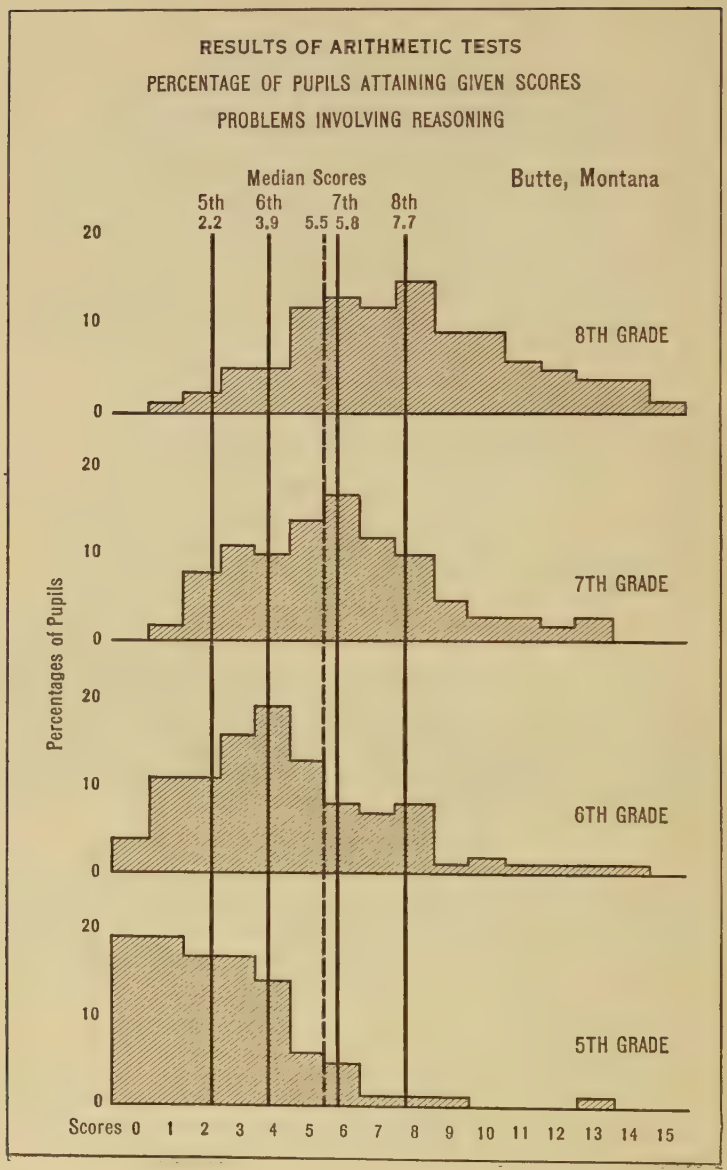
RESULTS OF ARITHMETIC TESTS
PERCENTAGE OF PUPILS ATTAINING GIVEN SCORES
PROBLEMS INVOLVING REASONING
Median Scores
Butte, Montana
5th 2.2
6th 3.9
7th 5.5
8th 5.8
7.7
8TH GRADE
7TH GRADE
6TH GRADE
5TH GRADE
Percentages of Pupils
20
10
0
Scores 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Fig. XV

Summary of Benefits of Measuring as Shown in Figures II–XV.

1. Pupils and teachers are enabled to see how far each pupil has progressed, and where he is with regard to the grade standard. Figures II, VII, VIII, XII.

2. Teachers and supervisors are enabled to see progress and status of classes. Figures III, IV, XI.

3. Superintendents, school boards, and teachers are enabled to see how their school system compares with other representative systems. Figure XV.

4. The facts of vacation losses are established. Figure V.

5. Individual differences are strikingly portrayed. Figures II, XIII, XIV.

6. The particular weaknesses and strengths of individual pupils are indicated. Figures VIII, IX, XII.

7. Prospective teachers are enabled to compare their abilities with the standards for respective grades. Figure X.

8. The futility of expecting transfer of ability in isolated combinations to examples and problems is illustrated. Figure VII.

9. Means of economizing time are shown. Figures II, XIII, XIV.

Measuring Results in Spelling.—At first thought, measuring results in spelling seems a simple, straightforward task, but Doctor Buckingham [44] has shown that there are words and *words*—even simple words and *simple words*—to spell. And instead of its being the apparently easy task to get accurate measures of spelling ability, it is really a very complex problem. For example, how much credit ought to be

given for spelling such words as *only* and *chicken* as compared with such words as *quarrel* and *guess?* Ordinarily, there is no recognition of difference in difficulty in grading spelling-tests and the same credit is given each word of the test. Doctor Buckingham shows that this practice is grossly inaccurate because of the wide differences in the difficulty of words, *e. g.*, the four words *quarrel*, *circus*, *carriage*, and *guess* are approximately three times as hard as the four words *only*, *even*, *smoke*, and *chicken*, and ought therefore to be so weighted in scoring a test.

The first extended measurements were made by Doctor Rice, and his article, "The Futility of the Spelling Grind" [15[a], 53], caused much improvement in the teaching of the subject. Cornman [52] and Pearson [47, 50] have also done measuring which has helped the teaching of the subject. Courtis includes spelling in his Series C [2]. Ayres [43] has measured spelling by the demands of adult life, and Jones [45] by the demands of school life.

For purposes of measuring progress from term to term, from year to year, etc., Doctor Buckingham's scales [44] will doubtless be the best help for some time to come. Through a large amount of scientific experimentation and a tremendous amount of labor, Doctor Buckingham has determined the respective difficulty of some 550 words. Fifty of these words are embodied in the book "Spelling Ability" [44], and it is much to be desired that Doctor Buckingham put the other 500 in available form for the use of teachers and supervisors, with definite directions for their use.

The words that are weighted by Doctor Buckingham in his book have been used under the direction of Miss Tall in the schools of Baltimore County, Maryland, and by Mr. Franklin in the Sul Ross School of Waco, Texas. The following graph portrays the results of one plan of using these tests:

SPELLING ABILITIES, SUL ROSS SCHOOL, WACO, TEXAS, AS MEASURED BY TWENTY-FIVE OF BUCKINGHAM'S WORDS IN SENTENCE TEST

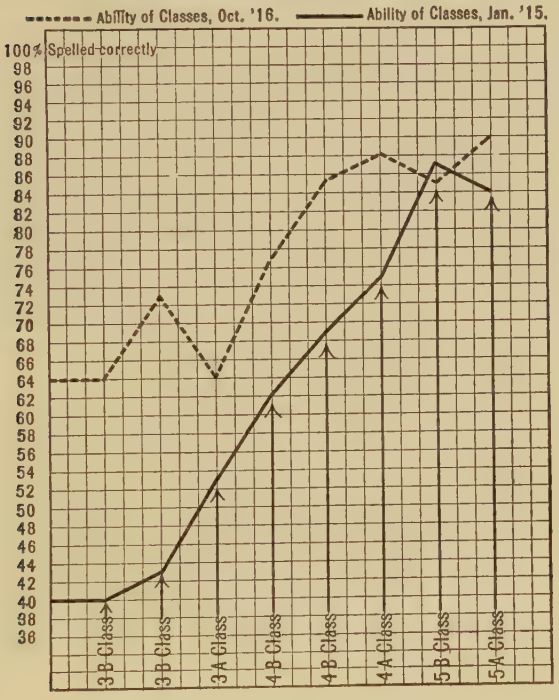

FIG. XVI

The writer is indebted to Mr. A. W. Franklin for permission to use the above graph. Of the conditions under which he secured the data he says: "These tests were given in October, 1914, and in January, 1915.

"After the October tests the sentences and words were not referred to any more by any teacher, they not knowing or expecting the test to ever come up again. Of course, all the classes were being taught in their regular spelling, reading, writing, etc., during the three months between the first and second tests."

A better means of testing pupils would be to select from the words taught between the times of testing a set of words equivalent in difficulty to those of the first set. Equivalence in difficulty can be secured by using Doctor Buckingham's method of weighting, and while this is difficult and laborious, it is the only way to get accurate measurements of improvement.

But even the reuse of the same words under the conditions stated by

Principal Franklin is much better than the ordinary use of lists of indiscriminately selected words, and the preceding graph, Figure XVI, will help Mr. Franklin's teachers in their spelling work incomparably more than the ordinary day-to-day hope-for-the-best teaching of spelling.

Measuring Results in Language.—In spite of the complexity of the subject, considerable progress is being made in developing means of measuring results in teaching language. The chief contributions are those of Hillegas [38], Courtis [2, 35], Jenkins [34], Thompson [9a], Bliss [40], and Ballou [36]. And though as yet there is no scale that is fully standardized as to the work that may reasonably be expected of the respective grades, the results of any one of these investigators is markedly better than the unaided personal judgment of teachers or supervisors.

The graph on page 537 summarizes the use of the Hillegas scale in the survey of the schools of Butte, Montana.

The attitude of teachers whose work in language has been measured is indicative of the value of the use of such tests. After considerable experimentation in the use of tests, Miss Jenkins [34] (then of Decatur, Illinois) secured expressions from her teachers as to their value. The following extracts are typical expressions:

From the teacher's point of view I feel as if the tests are very beneficial. . . .

These tests also enable the teacher to see in what ways the class needs help, or in what ways they are especially strong. In the last test given in my room, the majority of the class failed to have correct sentences because the comma, used in a series of words or phrases, was omitted, or because they misspelled "camel." They had never studied this use of the comma, so I inferred at once that some lessons in the proper use of it were necessary, and I planned my English lessons with this need in view. Some drill work in spelling the word "camel" was needed, so we added this word to our list of words for drill work. On the other hand, almost every one used the quotation-marks, the apostrophes, interrogation-marks, etc., with a certain degree of proficiency, and the teacher had the satisfaction of knowing

that her class had accomplished some things, and that her efforts had not been in vain.

The results obtained from these tests are well worth the energy spent in correcting the papers. They are beneficial not only to the teacher, but to the pupil as well. For he, too, compares his result with that of his classmates, and tries to correct his mistakes so as to improve when the next test is given.

Measuring Results in Drawing.—The one scale in this subject, that of Thorndike [54], has not been available long enough to get into extended use, but Kelly [1] found that the variability in judging drawings was much reduced by using the scale. This means that teachers will grade the work of pupils much better by using this scale than by depending entirely on their own judgment; and an added value of using the scale is that of being better able to detect and record progress. All art teachers recognize the need of this. It is comparatively easy, and ordinarily comparatively ineffective, to say to a pupil, "That is good," or "That is poor," or "You are not doing well to-day." It will be just as easy and much more effective to say to a pupil: "How does that compare with the standard you reached yesterday? or last week? or last year?" Then, too, with the perfection of this and similar scales there will come marked advance in the knowledge as to what are reasonable art attainments for typical pupils of the respective age groups.

Doctor Thorndike's discussion of how to use his scale is quoted at length, pages 510–11.

Measuring the More Subtle Results of Character Development.—Objection is sometimes made to measuring results by the use of standardized tests and scales on the ground that the use of such tests and scales does not and cannot measure the most important of all results, viz.: the results of character development. It is true that at present there are no standardized tests or scales for measuring change in character; whether there can be such means of measurement is a question for the future to determine. Let it be granted

FIG. XVII

Permission was kindly granted by the school authorities of Butte, Montana, for the reproduction of this graph. It represents "the percentage of children in the several grades who make the given scores in composition. For example, 1.7 per cent of the fourth-grade children wrote compositions scored at 0; 43.8 per cent of the fourth-grade children were scored at 1; etc. By following the median lines the overlapping of ability from grade to grade is disclosed."

On the basis of the measurement as portrayed in this graph the survey commission made the following observations:

"A study of the table giving the ratings upon compositions written by the children of Butte, along with an examination of the sample compositions reproduced to illustrate the merit of each position on the scale, reveals four facts which are worthy of note:

"First, the composition work is formal rather than free and imaginative.

"Second, the marks fall low on the scale throughout the grades. While no standard of achievement has yet been established with which to compare the ratings of the several grades in Butte, certain fifth-grade classes in Maryland have been found to average 5.15 as compared with 2.87 for the fifth grades in Butte. Also, certain seventh-grade classes in Maryland and New York City have been found to average 5.75 to more than 7.0 as compared with 3.75 for the seventh grade in Butte [1a].

"Third, there is relatively little growth from one grade to the next, the median score being raised less than two points, from fourth to eighth grade.

"Fourth, the wide variation in ability among the children in any one grade raises the question here which was suggested in connection with spelling, whether due attention is being given to the individual needs of the children, or whether the instruction is not being given to all members of the class alike, regardless of whether such instruction reaches the children's individual needs."

The median scores given above, together with the averages from the Maryland and New York measurements, are a start toward standards in composition for the respective grades.

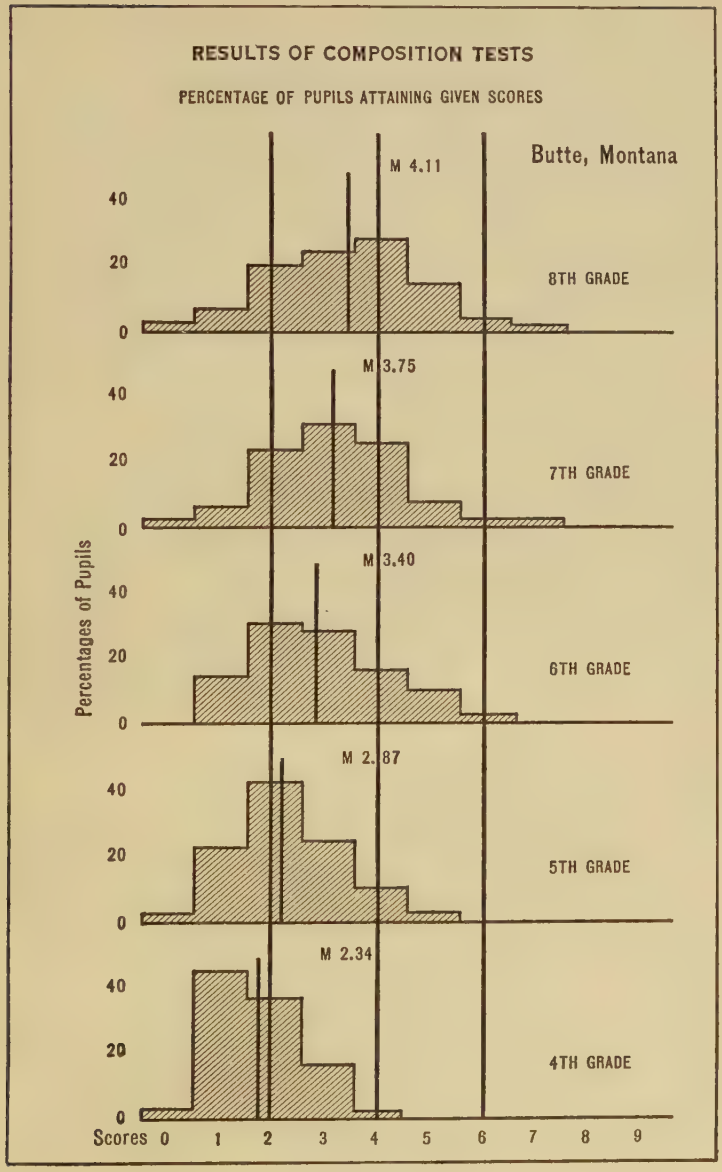
RESULTS OF COMPOSITION TESTS
PERCENTAGE OF PUPILS ATTAINING GIVEN SCORES
Butte, Montana
M 4.11
8TH GRADE
M 3.75
7TH GRADE
M 3.40
6TH GRADE
M 2.87
5TH GRADE
M 2.34
4TH GRADE
Percentages of Pupils
40
20
0
Scores 0 1 2 3 4 5 6 7 8 9

FIG. XVII

that the available objective tests and scales do not measure all the results of teaching. Why should this fact hinder their use? There can be but one valid answer, viz.: that the use of such tests will tend to obscure the more important duty of the teacher. The objection is variously stated, *e. g.*: "*The giving of such tests will overemphasize that which is tested, and that which is tested is the more formal work of the school.*" Another frequent form of the objection is: "*The most important factor in teaching is the teacher's personality, and no test can measure the results of personality.*" Again it is said: "*The benefits of school work come much more largely from the methods of work than from the knowledge acquired.*"

Each of these statements contains a certain amount of truth. It is true that the giving of tests calls attention to that which is tested, that the most important factor in the school is the personality of the teacher, and that the learning of methods of work is more important than the learning of facts. But it is also true that no tests need to overemphasize that which is tested, that no products of school work can be measured without measuring the influence of the personality of the teacher, and that no methods of work can be learned without work. It therefore follows that with proper safeguards the results of any teaching may be properly measured. The danger of overemphasizing the formal is further discussed under noteworthy dangers, below. It ought also to be kept in mind that the use of standardized tests enables the teacher to know just what is expected of her and just how well she is fulfilling these expectations; hence, the competent teacher will be relieved of the anxiety of uncertainty, and her personality will be much more available to work the more subtle changes of character development.

It is also true that just to the degree that superintendents and other supervisory officers are furnished with authentic evidence of the results of the more objective phases of a given teacher's work, just to that degree will these officers

be more free to study and evaluate the more subtle results of that teacher's influence. The use of objective tests will help to secure an adequate evaluation of the results of personality in another way, viz.: that of directing the attention of the supervisors to the changes actually made in the pupils. Too often at present supervisors base their judgment of teachers on their *opinion* of what teachers can do rather than on *what they have done.* It is often said: "Miss A. has a good personality; she must have a desirable influence on her pupils." The influence of objective tests will tend to have such observations take the form: "Miss A. has changed her pupils in desirable directions; she must have a good personality."

Three Noteworthy Dangers.—Just as there are dangers in the use of every keen-cutting instrument or highly organized mechanism, so there are dangers in the use of standards of achievement. These dangers will vary with the varying conditions and situations, and every teacher should be on the alert to guard against them. Three noteworthy dangers are: (1) That of overemphasizing the formal phases of education, (2) that of relying on the average, (3) that of relying on a single measurement of an individual. These are imminent in all situations and are therefore worthy of specific consideration.

1. *The Danger of Overemphasis.*—As noted on page 538, this danger is sometimes urged as an objection to measuring results, and it is a very real danger against which adequate precaution should be taken. As thus far constructed, tests and scales are largely limited to the formal as contrasted with the vital; to the tools of learning rather than the thinking of learning; to the abstract rather than the concrete. And for teaching to become dominated by the content of these tests and scales would be a grave mistake. It would be to take many steps backward toward the days of the bare three R's.

The chief way to guard against the dangers of measure-

ments, then, is to realize their limitations. For the present, they deal only with the formal or so-called fundamental elements, and while proper control over these elements is essential, school work on them could easily degenerate into mere cramming of facts if the "passing of the tests" should come to be the main concern of teachers and pupils. The main concern in all school work should be the improvement of life situations, and the formal or tool side of learning should be conquered as a *means* by which this improvement can be brought about. Teachers and supervisors can effectually guard against this danger by having the subject matter so selected and arranged that pupils come to the study of the formal phases of education in their concrete, vital setting, and by having the teaching so conducted that pupils conquer these formal phases as a means of solving vital problems. So approached and so conquered the formal phases come to be looked upon as essential tools of learning, and there is little, if any, danger of overemphasizing them by measuring the progress pupils make in conquering them.

A rigid limitation of the time to be devoted to specific drill on work to be tested is an effective practical means of avoiding this danger.

2. *The Danger of Relying on the Average.*—As a general indication of how one's pupils as a group stand with other similar groups, the average standing is worth while; but there is grave danger in relying on the average as a guide in judging of the excellence of teaching. As was shown on page 531, one of the values of using tests is that they show so conclusively the wide variability among pupils of presumably equal or nearly equal ability. In spite of the convincing evidence of the facts of individual differences, some superintendents and some teachers continue to treat classes of children as if they all needed the same teaching, with the inevitable result that all the pupils are hindered because the work has to be made "average," which means that it is too easy for the strong pupils, that it is too hard for the weak pupils, and

that the medium pupils are held back by the presence of both the strong and the weak.

But a greater danger is found in the possible fallacy of the average as a measure of progress. It is a fact that a teacher can get her class up to the standard as shown by the average, and still not give the pupils good teaching. Figures XVIII and XIX show this graphically.

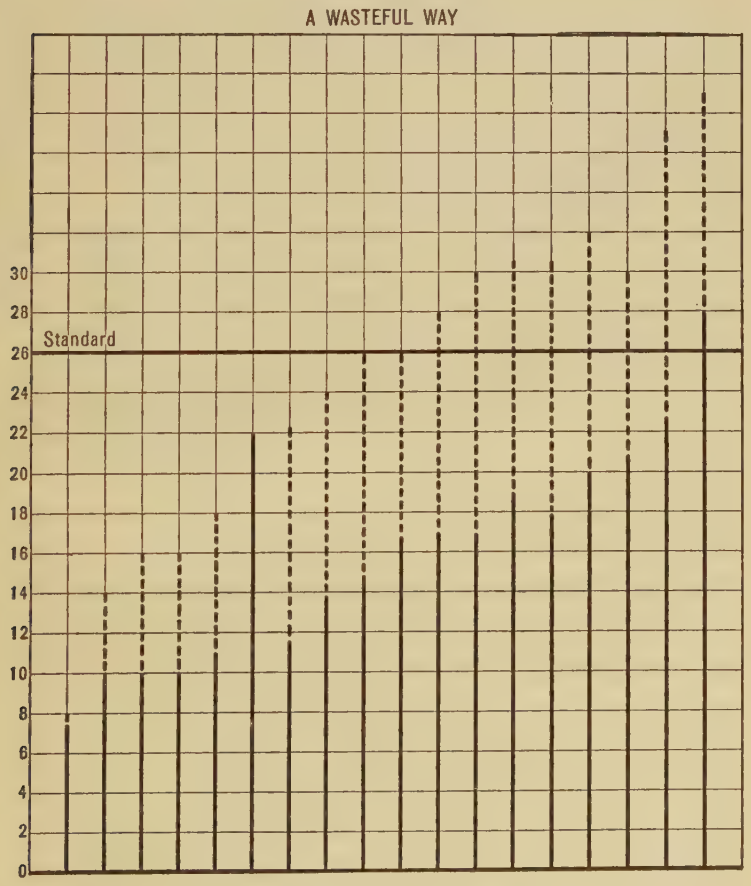

FIG. XVIII

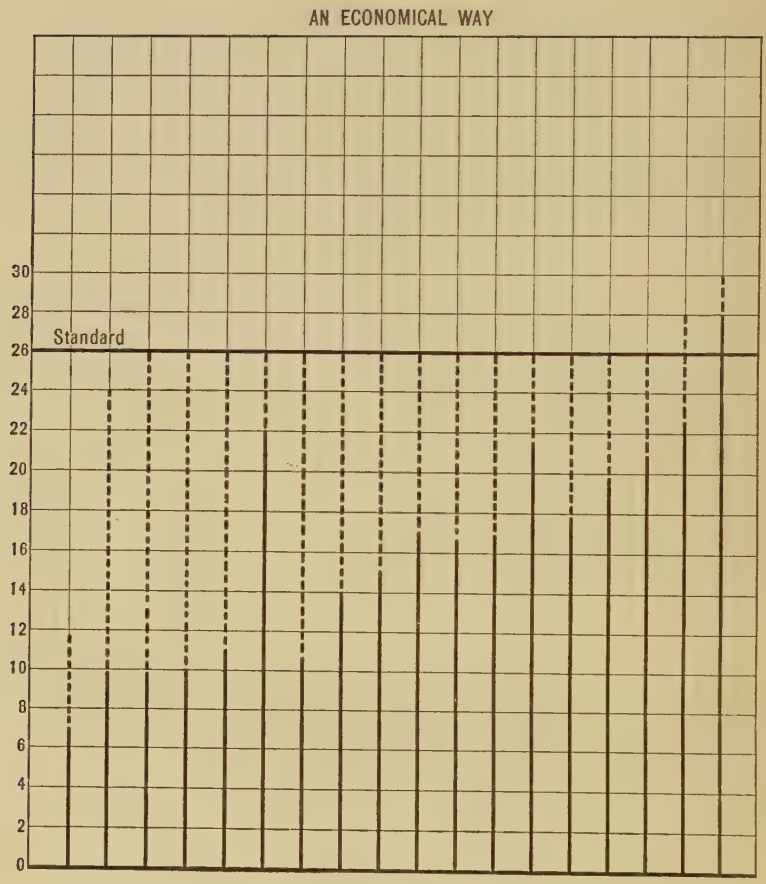

FIG. XIX

FIGS. XVIII, XIX

The solid lines in these figures represent the abilities of a Grade 4 class at midyear in division combinations. By the end of the year they should have reached the standard as indicated by the horizontal line. If the teacher were willing to rely solely on the average as showing that her class had come up to standard she could have taught them as a single group and secured approximately the gains as indicated by the dotted lines in Fig. XVIII, and the average would have indicated "up to standard," but if the teacher desired to help

each individual pupil according to his needs, she would teach them in three or more groups and secure approximately the gains as indicated by the dotted lines in Fig. XIX, and the average would also have indicated "up to standard."

The harm in following the wasteful way is that it wastes the time of *all* the pupils. The naturally competent respond readily and go beyond the standard, which means that they are using their time to learn something that they do not need and which the majority will therefore straightway forget. These quick pupils would much better be freed from most of the work in division and thus economize their time, and give the slower ones an opportunity to get the kind of teaching that would bring them up to standard.

As is indicated in both these figures, it is probable that most classes will contain one or more pupils so weak in at least some abilities that they ought not to be brought up to standard.

3. *The Danger of Single Measurements.*—As is shown in some detail above, it is of prime importance that teachers deal with the results of measurements in terms of individual standings rather than in terms of the average. The important fact is not the standing of the mythical average pupils, but that of the flesh-and-blood, deviating pupils. But there is need of caution in this, also, for there is danger of misjudging some pupils if unguarded reliance is placed on single measurements; for a moment's thought will convince one that any pupil is liable to have an "off day," *e. g.*, perhaps the test comes the day after a party, or the hour before a circus. In either event it is safe to say that few pupils will do themselves justice in the test. Of course, the teacher should guard against such distracting influences as the circus by her choice of time for giving the test; but do the best she can as to time, some pupils are liable not to be up to their ordinary capability. Hence the teacher must be careful and not misjudge a pupil by placing too much store by the results of a single measurement. If a pupil has been doing good work and falls low in a test it is always essential that he be given at least a second trial before passing judgment as to with what group he ought to have his further teaching. An illustration of the need for this precaution is shown in Figure XX.

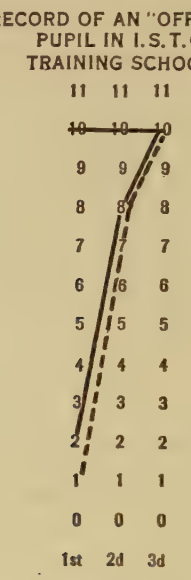

FIG. XX

This pupil did very poorly in this test in division on the first day and seemed to be a candidate for the lowest group, in that she tried only two out of ten examples and got only one right; but on the second trial she came up markedly, doing eight out of ten, getting all correct; and on the third trial she did all ten and got all correct.

The arrangement and general plan of the Courtis Practice Tests make them a noteworthy help in avoiding this danger.

How to Begin Measuring.—The way to begin is to *begin*. Doubtless the best way is to see some one give a test or use a scale. But if this is not practicable, do not procrastinate; get a set of the more simple tests, read the directions and give them. Then read the directions for scoring and score the results. Do not be in a hurry to understand how to do all at once but take the work step by step. The Courtis tests are well adapted to making a beginning, both because they are comparatively well standardized and because of the clear, full directions which accompany them [2, 3]. Of the available scales, those on handwriting are probably best for beginners. Their use is very simple, and a little practice

according to directions will enable any earnest, intelligent teacher to increase manyfold her ability to evaluate her work. This is a pioneer field for teachers, and it is therefore a rough, unbroken field, but it is a fruitful field, and it is a satisfactory field. It yields the joy of known achievement.

SUMMARY

1. The introduction of standardized tests and scales into the work of teaching is similar to the introduction of such scientific instruments into other vocations.
2. These scales are of the greatest value, even in their tentative stage, and teachers can learn to use them without special statistical or psychological training.
3. At present, standardized tests are largely confined to the more formal phases of school work, "the three R's," although notable beginnings have been made in other phases, such as drawing, composition, and health and physical development.
4. Developments and improvements in this line are very rapid, and progressive teachers and supervisors are alert to learn the latest improvements as they appear in the educational journals and elsewhere.
5. In making use of the standard tests, directions must be carefully followed if results are to be compared with standardized scores.
6. Certain dangers in wrong uses of the available tests are real, but with proper precautions most of the evils may be avoided.
7. There is no real conflict between measuring the results of teaching and the development of the subtler phases of social efficiency. In fact, the tests help to liberate teachers and pupils from much unnecessary drill.
8. Initiative is necessary in making a beginning in the use of such tests, as in every other progressive movement, but, once in, the teacher has allied herself with a movement that promises more than any other for making teaching a profession.

PROJECTS IN APPLICATION

1. In the *Elementary School Journal* for September, 1916, Doctor W. S. Gray has made a list of standard tests and scales for the various subjects. Find this article and add to it any new standard tests published since that time.
2. Get a set of the best tests of the speed and comprehension of reading, and test either yourself and your class or some other group with it.

3. How fast is the typical (median) eighth-grade pupil able to read standard reading material for his grade, and with what degree of comprehension? What is a fair rate for adults?
4. How early in a term do, say, ten per cent of the pupils of the sixth grade attain a reasonably desirable proficiency in certain standard tests, such as those of arithmetic by S. H. Courtis, making it possible to excuse them from further drill and do other work?
5. If possible, test two different methods of drill in certain fundamental operations in arithmetic, and determine by the standard test which gives better results.
6. What additions to your knowledge of educational measurement do you get from a reading of the chapter on this subject in Strayer and Norsworthy's "How to Teach"? (Macmillan.)

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CHAPTER XXIV

PROSPECTIVE ELEMENTARY EDUCATION[1]

Preliminary Problems

1. When does the average adult read or think or study in his every-day life activities? For what types of purposes?
2. From chapter one and from your own experience what do you infer to be the immediate reason for studying and learning?
3. Do you learn more about how to make a back-yard garden by reading about it as a classroom subject or by making the garden and studying different problems as they come up?
4. Is it better to have a thorough course in the mechanics and methods of running an automobile, sewing-machine, lathe, or reaper before trying to run one, or to learn while and by running it?
5. If this is true for adults, is it more or less true for children?
6. What are the advantages of such schools as those of Gary and Tuskeegee over ordinary bookish schools?
7. What are the advantages and disadvantages of the home-project method of teaching agriculture or home economics?
8. What are the proper combination of study and motor activities for children of elementary school age?
9. Do you think it is possible or desirable to correlate, or subordinate, information getting with active, motor "occupations"?
10. What are the characteristics of the most natural and fruitful learning in children?

I. Pragmatism and Intelligence.—According to the point of view called pragmatism, intelligence, or the power of thought, is developed out of the struggles of organic beings to secure a successful exercise of their functions. The doctrine may be compared with the theory of "economic interpretation of history," taken in its broad sense. According to this theory, the main features of the structure of any particular society are best understood by looking first into how

[1] Editorial Note.—This chapter is reprinted from the first volume of *The Progressive Journal of Education* by permission.

that society went at the problem of maintaining itself in existence—how it undertook the primary business of "making its living." Similarly, the transformation and evolution of successive social states depend upon the introduction of new factors and forces into industrial production and exchange, so that men's points of view—judgment of values—and the location of power—of control of nature and hence of others—are changed. Now, in a somewhat analogous way, pragmatism holds that all the higher achievements of individual organic life result from the stress and strain of the problem of maintaining the functions of life. For life can be kept going only as the organism "*makes* its living," by proper manipulation of the environment and adjustment of the latter to its own vital ends. Reduced to their simplest terms, the biological problem of the individual and the economic problem of society are exactly the same. In each case the aim is to subordinate the materials and forces of the natural environment so that they shall be rendered tributary to life functions.

Now, while this requires direct contact with things in seizing, digesting, etc., the limitations of the direct method of subjugation of materials to function are very great. The evolution of the nervous system represents the discovery of the advantages of indirect control by manipulation of the present environment on the basis of the past and future, of the felt and seen on the basis of the remote and foreseen.

On this basis, it is not the business of thought to mirror with theoretical or speculative exactness an outside world. It is its business to select whatever is relevant to the most effective carrying on of life functions, and to arrange what is selected, not on the basis of some outside pattern, but with reference to facilitating the complete performance of all the activities possible to an organic being. Knowledge, accordingly, is not an attempt to copy, after the fashion of an encyclopedia, all the facts of the universe. It is the expression of man's past most successful achievements in effecting

adjustments and adaptations, put in a form so as best to help sustain and promote still greater control of the environment in the future.

Former Theories.—This theory of the nature of intelligence and knowledge is contrasted with the two other theories which have practically divided the field between them in the past. One, which may be called the transcendental theory of pure rationalism, is that the mind is an immaterial entity, temporarily housed in a material organism, having thought or reason as its own independent or *a priori* power, and creating knowledge by the exercise of its faculties, just because it is the very nature of thought to produce knowledge. Knowledge, on this view, is an end complete in itself. It simply represents the deposit that results from the exercise of a purely theoretic faculty. It may possibly have some useful application in activity, but that is purely accidental —it is an afterthought. Knowledge is complete in itself just as soon as the purely theoretic capacity of reason has expressed itself.

The other contrasting view is that mind is a blank piece of paper, or a passive wax-like something on which objects impress themselves, and the accumulation of the records left behind constitutes knowledge. This view underlies, for example, Spencer's theory of evolution, according to which mental forms and powers have been developed by the constant impact of environmental forces, the more transient features obliterating one another's effects, while the more permanent have moulded intelligence into their own likeness. Knowledge, on this view, is a replica or duplicate edition within consciousness of what already exists ready-made without.

Likenesses and Differences.—Now the pragmatic view of mind and knowledge agrees with this latter account in that it regards mind as a development and lays a great stress upon the relation between organism and the environment. But it regards the evolution of mind as a growth out of the constant

tendency of life to sustain and fulfil its own functions through subordinating environment to itself rather than by passively accommodating itself to a coercion working from without. It does not regard intelligence, therefore, as merely a result of evolution, but as also a factor in guiding the evolutionary process; for it regards intelligence as an evolution of the functions of life to the point at which they can be performed most effectively. Similarly, knowledge, on this view, is not a copy whose truth is to be judged by its fidelity to an original; *it is an instrument or organ of successful action.*

We do not judge the value of the hand or eye on the basis of their being copies of something previously existing in the environment, but on the basis of their worth as instrumentalities of adjustments. On the pragmatic view, the case is the same with knowledge. What measures its value, its correctness and truth, is the degree of its availability for conducting to a successful issue the activities of living beings.

What we call "theory" and pure science are not then academic exercises of an isolated or transcendental reason, working according to its own *a priori* laws. They are simply the product of an unbiassed, *unprejudiced* view of the conditions and consequences of the most efficient and fruitful action. For the success of an activity may be judged from either a narrow or a wide standpoint. When the individual views everything with reference to his ends and needs in isolation from the society of which he is a member, we do not get scientific knowledge, but knowledge in the form of opinion and dogma. When the individual considers the conditions and results of his activities from the standpoint of their bearing on the successful issue, or welfare, of the activities of the community, he gets the broadest, most general (or objective) point of view possible for human beings from which to know. The result of taking this social, instead of the purely personal, point of view is knowledge in its best sense—namely, science. And history shows that the advance of science represents the gradual victory of the more generic, or social, point of view

over purely individual points of view, opinions, and merely class points of view—dogmas. *Pure* knowledge, in short, is knowledge on the basis of the widest and most effective application or service in social progress instead of individual advantage secured at the expense of others. It is therefore not properly opposed to applied or useful knowledge.

Since one of the main offices of education is the training of mind—since, indeed, this is the only office of education when we consider mind in its organic connections with character—a changed view of the nature and purpose of mind carries with it a very great change in educational ideas and practices. Education in the past has been dominated almost entirely by a combination of the two older views of mind which I have noted—that of a *pure reason* or of a *purely passive and receptive vessel.* In general, the education of the "leisure class," the prevalent idea of "culture," is based on the notion of a mind separate, so far as possible, from material conditions and soiled by contact with them, a mind whose highest end is production of knowledge for its own sake. On the other hand, education for the "masses" has been considered a process by which certain features of their environment were ground in upon them, till their minds were moulded into passive and obedient conformity to the existing type about them.

Thus, to review, educational theory and practice in the past have been associated with two different theories of the nature of mind:

1. One theory is that the highest faculty of mind is reason or pure thought, whose exercise results in knowledge. This view goes along with the notion that knowledge is *an end in itself, apart from social uses and applications;* it results in a theoretic type of education, one which its opponents condemn as scholastic and academic, while its upholders always defend it on the ground of "culture" and a "liberal," "humanistic" education. This type of education has prevailed almost entirely in the schools aiming to produce "gentlemen"

in the English conventional sense—that is members of the *ruling and leisure class.*

2. Another philosophy of mind has regarded mind as something *purely passive, to be impressed from without by sensations and images which are then arranged to produce knowledge and beliefs.* This notion has had its practical vogue mainly in education of the masses or "*lower classes,*" with the effect, more or less consciously designed, of making them the passive and willing upholders of the existing order. For the things that were impressed upon the children of the lower schools were not, for the most part, natural objects and events; but the *symbols* of knowledge and of the art of calculation—the written and printed forms of language and the rudiments of arithmetic. The effect was twofold. On the one hand, it developed mental dependency and submissiveness. *Docility*, or *obedient* absorption of material presented by school-teacher and text-book, has been the traditional and conventional virtue of the schools. On the other hand, the social and economic conditions of elementary education have been such as to invite and to compel the great bulk of elementary school children to leave school at the point where they had enough reading, 'riting and 'rithmetic to make them more useful in subordinate economic positions, but not enough to encourage or enable them (save in rare instances) to rise to the point where they were masters of the direction of their own physical and mental powers.

The New Theory of Mind.—Now, as was suggested above, the pragmatic theory of mind and of knowledge is adapted both to a different scheme of educational practice and to a different social aim for it. The pragmatic view of mind is that intelligence has developed primarily as an organ of readaptation and readjustment amid the needs of active functions that are continually increasing their complexity. The ameba has little need of mind and knowledge. Its functions are simple, largely undifferentiated, and exercised in a medium which is simple, mainly all of one kind. Man lives

in a highly differentiated environment, a natural and social world in which there is an endless diversity of factors to be taken account of; and where the maintenance of life and the successful achievement of ends depends upon delicate and far-reaching combinations of various factors. Every advance in civilization, every progressive social change, increases the number of factors at work and also the difficulty of keeping them balanced up (or co-ordinated, as we say technically) with one another. The meal of the savage, his clothes, his shelter, bring into relation to one another only a scanty number of elements, existing at most over a short period of time, covering only a few square miles of space, and involving the co-operation of but a few score of people at most. The corresponding satisfactions of a modern denizen of a city, even of the poorest, are syntheses or co-ordinations of factors that operate almost over the entire world, cover a period of some years of successive activities and require the coadjustments of thousands of people.

Now this is only one illustration of a general law of development. The modern astronomer or chemist not only has thousands of facts to deal with where his ancestor had one, but he also has the problem of classifying, grouping each new fact; of fitting in with other facts, a process which perhaps requires the correction and reclassification of old facts as well as the interpretation of new ones. In this way, for example, the new facts discovered by Darwin were not merely added to old ones, but their discovery compelled a thorough re-examination and restatement of every previously known detail of botany and zoology. Wherever we look we find organic evolution both multiplying the number of details or elements that enter in, and also increasing the problem and the task of keeping these all properly balanced up with regard to one another. Otherwise, the mere increase in number and the unlikeness of parts would lead to utter confusion and a breakdown from dead weight. Because the human organism has so many more specialized parts or organs than the ameba

or the oyster, it is exposed to the danger of thousands of maladjustments and failures of co-operative activities which do not confront the other animals. And the same is true in comparing modern societies with savage groups.

The pragmatic theory points out that mind or intelligence is an accompaniment of just this process of organic growth in nature and in society. Mind is, so to speak, a device for keeping track of the increased differentiation and multiplication of conditions, and planning for, arranging for in advance, ends and means of activity which will keep these various factors in proper adjustment to one another. This explains the fact that all intelligence involves a peculiar combination of the sensory and receptive factor (emphasized by the passive theory of education) with the active, intellectual factor—emphasized by the theory of pure rational activity. The function of sensation is to afford stimuli to properly directed behavior—*i. e.*, to behavior which will keep the life functions properly adjusted. With respect to knowledge, sensations indicate the condition of things with respect to which the organism has to act. The object of sensations is not to mirror or even register the whole external world, but simply to make the individual agent aware of those things in the environment which threaten its welfare or which afford the resources needed at the given time in the life adjustments of the individual. If we regard sensations as intended to give knowledge of the external world in its entirety, they are ludicrously incompetent to the end. If we regard them as devices for warning an agent of threatening dangers and for calling out responses which will enable the agent to protect himself and to avoid or destroy the obstacles, they are admirably fit for the purpose.

Thinking.—When, however, situations are complicated, the reports that come to an organism of the state of things that require attention if the organism is to hold its own are very diverse and incompatible. It would be impossible for the organism to react to them all at once; but it might be

fatal for it arbitrarily to select one or a few, and ignore the others. A mistake in the selection must destroy the organism. Thinking develops accordingly as a method of *valuing the importance* of the various stimuli that demand attention. Judgment, in the popular usage, is precisely power to estimate the *relative value* of things as claimants for notice and responsive behavior. A faint sound may be of more importance in the long run than a loud one; a dim light more fraught with consequence upon the welfare of the organism than a bright one. Thought is required to discount their immediate strength, and to interpret them on the basis of their *indirect* and remote *consequences*. The power of imagination weighs the various stimuli that are struggling to control action up against one another; devises a method for discounting those which may be only momentarily more violent, and works up seemingly insignificant reports. Thus imagination and thought are processes of estimating observed objects in the light of their possible future consequences. They are forecasts, tentative predictions or conjectures as to what present conditions indicate or prophesy regarding future developments. All ideas are of the nature of what the scientist calls "working hypotheses"; forecasts of what will happen under future conditions; forecasts employed, moreover, to guide and direct activities so that if possible the desirable conditions will be realized. Those ideas that really "work"; the forecasts that future events verify when they arrive; the plans and methods of behavior which successfully modify conditions in the direction desired, are *true;* and the term truth as applied to judgments and ideas has no other meaning than this.

II. Educational Bearings on Methods.—I now touch briefly upon the bearings of this conception of mind upon the question of educational *method*, reserving for a later section its bearings upon the *subject matter* of study, and upon the social or moral basis and aim of schools:

1. *Every educative process should begin with doing some-*

thing, and the necessary training of sense-perception, memory, imagination, and judgment should grow out of the conditions and needs of what is being done. The something done should not be of the nature of an arbitrary task imposed by a task-master, but something inherently significant, and of such a nature that the pupil appreciates for himself its importance enough to take a vital interest in it. This is the way the child gets all the first training of his powers and all his first knowledge of the world. In carrying out his instinctive tendency to reach, handle, throw, a baby learns to know his own limbs and their capacities, and becomes acquainted with the properties of things—their hardness, color, form, size, and a thousand and one properties. He did not start to know these things, nor did any teacher set him the lesson of finding out about them. He started to *do* something, and these results came necessarily.

For a few years of his life, the first few, a child's instinctive eagerness and the natural environment are so well adjusted that this educative training goes on at a very rapid rate and, relatively speaking, almost without oversight or guidance. There comes a time when a richer, fuller, and more carefully selected and arranged environment is required to afford the stimuli and conditions of the most educative activity. An environment more varied than that of the ordinary home, and yet one not so varied, disorderly, overpowering, and overspecialized as that of social life in general.

Conscious education begins at this point. If it were what it ought to be and what it may become, it would consist in the selection and arrangement of an environment of materials and tools, with models of the best artistic achievement of such a nature as to call out and exercise the child's life functions—to suggest to him, in other words, things worth doing and to keep him engaged in doing them. Teachers would be present, more competent, more experienced members of a society; but they would be present as fellow workers and fellow players—comrades in carrying on the scheme of play

and work activities, and in building up, along with the children, a miniature world as the obvious result and reward of their joint activities.

2. *Sense training would inevitably result from engaging in these various activities.* The boy who plays marbles and ball, the girl who dresses and undresses her doll and makes clothes for her, gets a training of the senses which is all the more effective because it is incidental to the carrying on of some line of action, and is not set up as a special task or end in itself. Clay modelling, gardening, shop work in wood or metal, cooking, weaving, etc.—these are the normal methods for cultivating power of observation and accurate interpretation of sensations. The race did not acquire its original store of information for the sake of knowledge, nor yet by having natural objects impress themselves on the mind. It learned about plants, animals, stones, metals, weather, etc., because a knowledge of these things was required *to solve problems* of food, shelter, clothing, social co-operation, and defense, and so on.

3. *The more intellectual side of education, the store of general ideas and principles, the requisition of habits of reflection and deliberation, should be placed on the same basis.* All thinking at its outset is planning, forecasting, forming purposes, selecting and arranging means for their most economical and successful realization. Comparatively little opportunity is afforded in our present school systems for the practical activities which are necessary to develop this type of thought. Opportunities for independent manipulation of materials, initiative, and responsibility for getting results, for detecting and correcting errors, are few and far between. As a result, the power of thinking remains comparatively undeveloped except in the few who are naturally adapted to more specialized and purely theoretic interests—children and youth whose thinking clusters about the symbols for things, rather than things themselves. Such persons get specialized naturally into an academic class of investigators and speculators. The

world doubtless owes a great deal to its pure "researchers" and scholars; but it would owe a great deal more still to them if they had been educated into habits of thinking out the *bearings of their abstract ideas upon social matters*. As it is, they have been largely shunted off into an isolated and remote class—isolated and remote socially, that is—where the results of their thinking are quite "safe," because not translated from symbols into the facts of action.

Traits of Intellectual Instruction.—In an educational scheme which should embody practically the pragmatic conception of thought, intellectual instruction would have, then, the following traits: (*a*) *It would grow—all of it—out of the needs and opportunities of activities engaged in by the students themselves*. This principle would be universal. At present it is expressed sporadically; to some extent in the kindergarten at the lower end, in the scientific laboratories at the upper, and in the manual and occupational activities of shop work, cooking, etc., along the line. (*b*) *Information would not be amassed and accumulated and driven into pupils as an end in itself*, but would cluster about the development of activities. Some information is immediately required in order to do anything successfully; a child cannot garden intelligently without learning about soils, seeds, measures, plants and their growth, the facts of rain, sunshine, etc. Interest in the continuous carrying on of such an activity would, however, generate curiosity and openness of mind about many things not directly related to the immediate needs. Methods of agriculture in this and other lands, the historic evolution of this occupation, the social and economic problems connected with it, have a natural interest and avenue to the mind of one who has developed personal interest in a similar activity, which they cannot have for one who merely hears or reads about them second hand. One great object, then, in having school work organized mainly about certain continuous lines of occupation is that these afford natural axes for the collection and organization of all kinds of facts and ideas. (*c*)

Instruction carried on upon this basis would teach the mind that all ideas, truths, theories, etc., are of the nature of working hypotheses. One of the chief obstacles to the progress of the race has been the *dogmatic* habit of mind, the belief that some principles and ideas have such a final value and authority that they are to be accepted without question and without revision. The *experimental* habit of mind, that which regards ideas and principles as tentative methods of *solving problems* and organizing data, is very recent. An education based upon the pragmatic conception would inevitably turn out *persons who were alive to the necessity of continually testing their ideas and beliefs by putting them into practical application, and of revising their beliefs on the basis of the results of such application.*

III. Educational Bearings on Subject Matter.—Having spoken of the pragmatic theory in general and of its special bearings upon educational method, I propose to speak briefly of its connection with educational subject matter, or the material of the course of study. For the last two or three centuries educational reformers have protested against the conventional scheme of studies on the ground of its artificiality and remoteness from life. At first they protested against its verbal and linguistic character, against the fact that it was devoted so exclusively to symbols of learning. This protest has been more or less effectual and material from nature (the sciences) and from the life of man (history) introduced into the schools. Then there was a protest against the exclusively informational character of these studies—against the emphasis upon memorizing and the accumulation of knowledge—and a demand for what would connect more directly and more usefully with contemporary social requirements. Industrial drawing, manual training, the rudiments of various arts have been introduced in response to this demand. If we add to the list of studies finally pursued in the schools the subjects of music and the other "fine" arts, we do not wonder that there has grown up an outcry against an over-

loaded curriculum, lacking in unity and concentration, scattering and overstraining the activities of both teachers and children. There has even been a cry for a return to the simplicity of the meagre fare of the old-fashioned three R's. But is there not some other way of securing organization of material and unity of purpose?

Occupational Activities as a Centre.—The education of the human race, upon the whole, has been gained through the *occupations* which it has pursued and developed. The vocations, the professions, the lines of activity which have been socially evolved, have furnished the social stimuli to knowledge and the centres about which it has been organized. If occupations were made fundamental in education, school work would conform to the principles of social and mental development. The beginnings of this reform have already been introduced. Froebel got a glimpse of this conception in his scheme of education for infancy, though his policy was too romantic and symbolic to permit the idea to get adequate expression. Engineering and technical schools, in which the sciences are pursued in reference to their social uses, illustrate, at the upper end of the school ladder, another aspect of the same principle. The increasing emphasis upon gardening, horticulture, cooking, weaving, shop work in wood and metal in the elementary and secondary schools is another symptom of the same movement. The ultimate value and (let us hope) destiny of the present movement toward industrial education will depend upon whether it becomes switched off into a method of class-education—in which case it would be better for it to perish immediately—or whether it recognizes the fundamental importance of training in typical and continuous lines of activity, which are of social value for everybody.

Educational Values.—It is a serious error to think of occupational activities as if they were merely of prosaic and utilitarian, or even commercial, worth. Their primary value is educational. It consists in training the thinking of the

boys and girls in connection with things that appeal to them as worth doing, instead of training thought-power by partly formal tasks and gymnastic exercises. It does not exclude, but includes a broad and liberal scheme of knowledge. All typical social occupations rest upon scientific insight and information. One of the chief values of shop work, weaving, gardening, etc., even in elementary schools, is that they introduce the pupil to natural facts and forces and give him a motive for becoming thoroughly acquainted with the concrete facts and laws of nature. The historic development of the occupations by which men have subjugated nature by learning its secrets, and have learned how to co-operate with another for common ends, gives the key to the study of history; it indicates what is important and what is trivial in the mass of facts that has come down from the past. An adequate mastery of typical occupations brings the pupil to a study of the social conditions and aims of the present; to facts which, when classified, form sociology, political economy, civics, and politics. The fine arts are naturally included; for, as Morris and others have pointed out, all embodiment of ideas in external form, when done freely and with joy in the activity, tends to gain an artistic quality. In short, there is nothing of science, history, or art which the educational experience of the past has shown to be of worth which an occupational education would not include. Old values would be conserved, but would be centralized about a new principle and acquire the vitality of a new motive.

Finally, such an education would change the morale of the school. Since the activities of the latter would be continuous with the interests and activities of men and women at large, the school would lose the special code of ethics and moral training, which must characterize it as long as it is isolated. It would take up into itself the moral aims and forces of social sympathy, co-operation, and progress. Occupations bring people naturally together in groups, develop a group of consciousness and power to divide and yet co-operate

harmoniously. Knowledge, scholastic attainments, esthetic culture, pursued, as at present, with only personal ends in view, tend to egoism, social stratifications, and antagonisms.

SUMMARY

1. The mind has been developed through variation and selection, like horns, tough skins, or great or microscopic bodily size, as a means of adjustment, as an aid in getting on well in the world, thus helping to satisfy the instincts and especially to aid in solving ever-pressing economic problems.
2. Knowledge gained by psycho-physical pursuits in gaining a living and living a life is thus also an instrument of better adjustment.
3. However, two commonly-held theories of much import for our schools are opposed to this view, namely, (1) knowledge is not a tool obtained for a purpose and for use in life, but is the results of the activity of the independent soul and thus an end in itself, and (2) that the mind is merely a recording device for receiving impressions from without.
4. Several comparisons and contrasts between these two theories and that of the first, or so-called "pragmatic" theory are brought out. The first, emphasizing knowledge for its own sake, is a leisure-class theory which gives us no clew for determining relative values in subject matter or methods. The second is a view of what lower-class schooling should be, the drilling of passive individuals into the knowledges and habits, especially of a tool character, which make them most docile subjects of the ruling class.
5. The new theory puts the emphasis on intelligence as a tool with which to attain purposes, on knowledge picked and modified to use for attaining the goal of living, on books, studies, subjects, and curricula as so many instruments for help in solving the problems of life, as suggested in chapter one.
6. Thinking is a high type of adjustment in which life situations are met by means of tentative solutions held in mind long enough to examine them for relative advantages and disadvantages in meeting the issue and then coming to a conclusion.
7. Three educational bearings appear from this pragmatic theory: (1) Every educative process should begin with doing something worth while to the individual and to society; (2) the senses would get a better training from such naturally motivated activities than from any formal sense-training exercises, and (3) desirable knowledge, habits, ideals, and appreciations in the direction of

social aims and individual needs should grow out of similar motor and social activities of school and community.

8. By making active occupations the correlating centre instead of book study as at present the following improvements in our elementary education would tend to come about, as they are now appearing in many of our best schools using such activities:

(*a*) The school would become more life-like and interesting, thus providing a happier life for the children which is their right.

(*b*) Knowing and doing would be so connected in the situation-response manner that knowledge, habits, ideals, and appreciations would not be merely school acquisitions or inert lumber of the mind, but active forces in every-day adjustment within and without the school.

(*c*) The habit of energizing, of executive competency, would be kept alive for dealing with the affairs of life.

(*d*) More useful knowledge would be gained and retained in the connection with situations in which it must be used.

(*e*) General discipline would be greater and formal discipline would not be relied on.

(*f*) The school would contribute more to the community and in turn be better supported by it.

PROJECTS IN APPLICATION

1. What activities would be listed under occupational and social activities to be made central in elementary schooling?
2. What activities do you think could be used in the rural schools of Porto Rico or the Philippines as an aid to the people in solving their problems of life? How could their problems be discovered by teachers and administrators?
3. How could the minimal essentials of the elementary school subjects be organically related to such activities and what advantages and disadvantages would accrue from such readjustment?
4. How could this be done in negro schools in the south or rural schools in the corn belt, or other section?
5. What city schools described in the writer's "Schools of To-Morrow" seem to be vitalizing their work by occupational activities?
6. Name ten ways in which the schools could be better connected up with the life of the people through occupational activities and a more naturally motivated school life?

7. What are some of the weaknesses of present laboratory methods of elementary or high schools?
8. What light does this chapter throw on methods to be followed in elementary schools?
9. What criticisms can you make of the point of view presented?
10. For futher data see the references in the following bibliography.

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APPENDIX

EXPLANATION OF TERMS USED IN SCORE CARD FOR MEASURING EFFICIENCY OF TEACHERS

I. *Personal Equipment* includes physical, mental, and moral qualities.
   1. *General appearance*—physique, carriage, dress, and personal neatness.
   3. *Voice*—pitch, quality, clearness of schoolroom voice.
   4. *Intellectual capacity*—native mental ability.
   5. *Initiative and self-reliance*—independence in originating and carrying out ideas.
   7. *Accuracy*—in statements, records, reports, and school work.
   10. *Integrity and sincerity*—soundness of moral principles and genuineness of character.
   13. *Tact*—adroitness, address, quick appreciation of the proper thing to do or say.
   14. *Sense of justice*—fairmindedness, ability to give all a "square deal."

II. *Social and Professional Equipment* includes qualities making the teacher better able to deal with social situations and particularly the school situation.
   15. *Academic preparation*—school work other than professional. Adequacy for present work.
   16. *Professional preparation*—specific training for teaching. Adequacy for present work.
   17. *Grasp of subject matter*—command of the information to be taught or the skill to be developed.
   18. *Understanding of children*—insight into child nature; sympathetic, scientific, and practical.
   22. *Interest in lives of pupils*—desire to know and help pupils personally, outside of school subjects.
   23. *Co-operation and loyalty*—attitude toward colleagues and superior officers.
   24. *Professional interest and growth*—effort to keep up to date and improve.
   26. *Use of English*—vocabulary, grammar, ease of expression.

III. *School Management* includes mechanical and routine factors.
   29. *Care of routine*—saving time and energy by reducing frequently recurring details to mechanical organization.
   30. *Discipline* (*governing skill*)—character of order maintained and skill shown in maintaining it.

IV. *Technique of Teaching* includes skill in actual teaching and in the conduct of the recitation.
   31. *Definiteness and clearness of aim*—of each lesson and of the work as a whole.
   32. *Skill in habit formation*—skill in establishing specific, automatic responses quickly and permanently; drill.
   33. *Skill in stimulating thought*—giving opportunity for and direction in reflective thinking.
   34. *Skill in teaching how to study*—establishing economical and efficient habits of study.
   35. *Skill in questioning*—character and distribution of questions; replies elicited.
   36. *Choice of subject matter*—skill with which the teacher selects the material of instruction to suit the interests, abilities, and needs of the class.
   37. *Organization of subject matter*—the lesson plan and the system in which the subject matter is presented.
   39. *Skill in motivating work*—arousing interest and giving pupils proper incentives for work.
   40. *Attention to individual needs*—teacher's care for individual differences, peculiarities, and difficulties.

V. *Results* include evidence of the success of the above conditions and skill.
   41. *Attention and response of the class*—extent to which all of the class are interested in the essential part of the lesson and respond to the demands made on them.
   42. *Growth of pupils in subject matter*—shown by pupil's ability to do work of advanced class and to meet more successfully whatever tests are made of their school work.
   43. *General development of pupils*—increase in pupils' ability and power along lines other than those of subject matter.
   44. *Stimulation of community*—effect on life of the community tending to improve or stimulate its various activities.
   45. *Moral influence*—extent to which the teacher raises the moral tone of the pupils or of the school.

Efficiency Record*

Teacher Miss E. (indicate sex) City XXV (or building) Grade taught III (or subject)

Experience 2 years Salary $57.50 per month

Highest academic training College graduate

Extent of professional training Pedagogical courses in college: for H.S. teaching

DETAILED RATING		V.P.	Poor		Medium			Good	Ex.
I. *Personal Equipment*	1. General appearance							X	
	2. Health				X				
	3. Voice						X		
	4. Intellectual capacity							X	
	5. Initiative and self-reliance			X					
	6. Adaptability and resourcefulness			X					
	7. Accuracy								X
	8. Industry							X	
	9. Enthusiasm and optimism					X			
	10. Integrity and sincerity							X	
	11. Self-control					X			
	12. Promptness							X	
	13. Tact					X			
	14. Sense of justice							X	
II. *Social and Professional Equipment*	15. Academic preparation				X				
	16. Professional preparation					X			
	17. Grasp of subject-matter								
	18. Unstanding of children			X					
	19. Interest in the life of the school						X		
	20. " " " " " " community					X			
	21. Ability to meet and interest patrons				X				
	22. Interest in lives of pupils						X		
	23. Co-operation and loyalty							X	
	24. Professional interest and growth								
	25. Daily preparation						X		
	26. Use of English								X
III. *School Management*	27. Care of light, heat, and ventilation						X		
	28. Neatness of room							X	
	29. Care of routine	X							
	30. Discipline (governing skill)	X							
IV. *Technique of Teaching*	31. Definiteness and clearness of aim			X					
	32. Skill in habit formation		X						
	33. Skill in stimulating thought					X			
	34. Skill in teaching how to study			X					
	35. Skill in questioning				X				
	36. Choice of subject-matter		X						
	37. Organization of subject-matter		X						
	38. Skill and care in assignment		X						
	39. Skill in motivating work			X					
	40. Attention to individual needs						X		
V. *Results*—	41. Attention and response of the class	X							
	42. Growth of pupils in subject-matter		X						
	43. General development of pupils					X			
	44. Stimulation of community			X					
	45. Moral Influence				X				
GENERAL RATING			X						

Recorded by ——— Position Supt. Date 1/15/15

* This scale is taken from the Fourteenth Yearbook of the National Society for the Study of Education, Part II, published by the University of Chicago Press.

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NOTE.—The brevity of this index is due to the fact that almost any topic desired will fall readily under one of the chapter headings and can thus be easily and quickly found.